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VALUE FOR RATE MAKING PURPOSES

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I HEREBY RECOMMEND THAT THE THESIS PREPARED BY _____

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ENTITLED _____

VALUE FOR RATE-MAKING PURPOSES

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PROFESSIONAL DEGREE OF _____ CIVIL ENGINEER

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VALUE FOR RATE MAKING PURPOSES

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INTRODUCTION

The regulation by governmental authority of corporations furnishing public services has become an accepted part of the economic system of the United States. Beginning shortly after the Civil War, and at first progressing slowly, the idea now has spread until nearly every state in the Union has a commission with regulatory powers of greater or less extent. Many of these commissions have wide authority over the rates charged by public service corporations, and the principles governing the determination of such rates are fairly well understood.

One of the basic principles of rate making is that a public utility enterprise is entitled to a reasonable rate of return upon the fair value of the property which it necessarily devotes to the public service. This principle is so well settled by commission practice and by decisions of our highest courts as no longer to be open to discussion. While the right to a reasonable return is thus firmly established, nevertheless the procedure necessary in determ-

ining the fair value of the property remains undecided, and forms one of the most vexatious questions commonly arising during the progress of an inquiry into rates.

Much of the prevailing confusion in this respect is clearly chargeable to our courts by reason of their failure to lay down specific rules for the determination of fair value. However, back of the failure of the courts to exactly define this value lies the failure of regulatory bodies to come to any substantial basis of agreement along these lines. And theirs is the duty in the first instance, for by law they are charged directly with that responsibility. The courts can decide questions only in the light of the evidence presented to them, and it is small wonder their decisions lack desirable exactness when there is so little agreement among authorities as to just what constitutes proper value for rate making purposes. I have no doubt that, if regulatory commissions come to substantial agreement as to what constitutes fair value, that in due course of time their opinions will be reflected in decisions of the courts.

While there has been a vast amount of discussion of valuation questions, and numerous volumes have been written thereon, nevertheless the writer hopes to present certain phases of the subject in such manner as to clearly set forth his convictions in the matter. From the experience gained by him in practical valuation and rate making work he has been forced to the conclusion that the determination of the fair rate making value of a property presents no insuperable obstacles, and that, instead of there being

a number of methods of determining this amount, there really is but one, and that one the simplest and clearest of all. Briefly, the value to which I refer is the undepreciated actual cost of the essential property devoted to the public service.

Practically my first experience in valuation work came while I was employed as assistant engineer of terminals by the Chicago Association of Commerce Committee of Investigation on Smoke Abatement and Electrification of Chicago Terminals. Part of my work in that capacity consisted in making a valuation of the steam railroad facilities that would be displaced in the event of electrification, such as engine houses, coal and water stations, turntables, certain shop machinery, and similar articles. Not having read the current twaddle on "theories" of valuation, I quite naturally turned toward the ascertainment of the actual cost of the above-named structures as affording the proper basis for the work, and carried it through on those lines. Inasmuch as, under similar circumstances, nearly all other persons engaged on similar work would have done likewise, I have arrived at the conclusion that actual cost forms the natural method of valuation.

During the five years immediately following the above-mentioned work, or, to be exact, from November, 1915, to February, 1921, I was employed as assistant chief engineer of the Illinois Public Utilities Commission, and during that time I had much to do with the practical side of making rates for public utility services. This experience was rendered the more varied and extended by reason of the fact that during this time the International War was begun and

and concluded. This period was marked by such rapid and abnormal price changes as to sorely tax the facilities of the Commission to care for the numerous rate cases that were brought before it and to give anywhere near the adequate consideration required in many instances.

During this period I prepared in behalf of the Commission appraisals of two small steam railroad properties, one large inter-urban railroad property, and a number of street railways. I also checked scores of appraisals prepared by engineers and submitted to the commission in various rate cases. Further, during these years there was completed the principal portion of the field work in connection with the Federal valuation of the steam railroad properties in the United States. Under the provisions of the act of Congress, as soon as the valuation of any railroad property was completed in each of the states, the report was submitted to the Governor of that state. In the practical working out of this provision in Illinois, these reports were transmitted by the Governor to the Public Utilities Commission. By official action of the Commission early in 1916, the writer was delegated to check over the reports as received and present the results of the work for such action as the Commission cared to take. In preparation for this work careful study was made of the numerous briefs and other articles submitted in advocacy of, or opposition to, the contentions of the railroads.

Aside from the questions arising in connection with the valuation of public utility properties, the writer also prepared many

opinions and orders of the Commission in rate cases involving gas, electric, water, steam and hot water heating, and street and inter-urban railway services. In addition thereto, he has sat as examiner for the Commission in many hundreds of rate and other cases, this work requiring a familiarity with regulatory practice.

Since leaving the Commission I have been continuously in charge of the appraisals of public utility properties, prepared at the instance of the owners of the properties, and embracing one gas, two street railways, one interurban railway, one steam heating, and three electric light and power systems. In each of the last-named cases appraisals were prepared on bases of historical reproduction cost and the cost of reproduction using either five-year or ten-year average prices.

From the foregoing it will be seen that the writer has been engaged on "both sides the fence" in valuation and rate matters, and, as a result of his experience, has come to have quite fixed views concerning the proper values to place upon properties in rate cases, and in the following pages will attempt to justify these conclusions. Briefly, as previously stated, in my opinion, the true rate making value of a public utility property is represented by the actual investment therein. This amount should not be depreciated except in rare instances where the management has been wasteful, improper, or where money has been paid out in excessive dividends when it should have gone into the upkeep of the plant.

Inasmuch as the value herein considered has mainly to do with

the fixing of the sum upon which a public utility may justly expect to earn a reasonable return in the way of rates for its services, it appears logical to first inquire as to what constitutes a so-called public utility, and what distinguishes it from other business enterprises in a community.

PUBLIC UTILITIES

A public utility may be defined as a business enterprise furnishing a service essential to the public convenience, and of such a nature that it should form a practical monopoly in the community. Commonly a considerable portion of the plant of such a corporation will be located along or under the streets and highways or upon other public property, and, as tenant or user thereof, becomes subject to certain control or regulation by the community or by the paramount authority of the state. Usually, too, a public utility acquires certain privileges not granted to other businesses, among which may be mentioned the right of eminent domain, or of preferment in the allotment of fuel during strikes, war, or other calamity. These privileges logically carry with them the right of control by the public to the end that the enterprise shall be conducted in the interests of the community, and that all citizens shall be served without discrimination or prefer-

ment, and at rates that are just and reasonable to the company and to its consumers.

The powers granted the Illinois Commerce Commission and its predecessor the Public Utilities Commission are probably as broad as those of any commission in the United States. In the act of June 29, 1921, creating the Illinois Commerce Commission, a public utility is defined as follows:

"The term 'public utility', when used in this Act, means and includes every corporation, company, association, joint stock company or association, firm, partnership or individual, their lessees, trustees, or receivers appointed by any court whatsoever (except, however, such public utilities as are or may hereafter be owned or operated by any transportation district or other municipality, and except such telephone company or companies which are or may hereafter be purely mutual concerns, having no rates or charges for services, but paying the operating expenses by assessment upon the members of such company or companies and no other person or persons) that now or hereafter:"

"(a) May own, control, operate, or manage, within the State, directly or indirectly, for public use, any plant, equipment or property used or to be used for or in connection with the transportation of persons or property or the transmission of telegraph or telephone messages between points within this State; or for the production, storage, transmission, sale, delivery or furnishing of heat, coal, light, power, electricity or water; or for the conveyance of oil or gas by pipe line; or for the storage or warehousing of grain; or for the conduct of the business of a wharfinger, or that"

"(b) May own or control any franchise, license, permit or right to engage in any such business." Section 10 of Article I of Act Approved June 29, 1921; effective July 1, 1921).

Regulation of utility properties by public authority has been practiced for many years and to varying degrees in different communities. Almost without exception, franchises granted such enterprises by municipal authorities have provided some degree of control over the conduct of the business of the company. Primarily,

such control arose from the fact that the company occupied streets or other public property with portions of its plant, and quite naturally the public sought to protect its rights by stringent contract regulations. Incidentally it was common practice to drive the hardest bargain possible for the use of the public highways, for, it was argued, the more the public got for the privilege the better off it was. Even today this viewpoint is assumed by many city officials who, ignorant of the true character of public regulation, imagine the amounts they secure from utility enterprises are that much clear gain. They quite overlook the fundamental concept that, in the end, the consumers of the services (which is the public itself) commonly pay all the service costs, including a profit on the transaction. In other words, they finally reimburse the utility for the sums expended by it for the privileges of using the public property, and, in addition, a return upon those amounts. Thus, when a municipality compels a street car company to pave its tracks for the privilege of using the street, it merely transfers the burden from one set of citizens to another. That is, the abutting property owner is relieved of the burden and the car riders are forced to take it up. Thus is one portion of the community discriminated against in favor of another, for on streets where there are no car tracks the abutting property owner is required to pay for the paving to the center of the street, while his neighbor, who may own higher-priced real estate fronting on a street car line, is relieved of a part of his just burden by the car riders.

Need of Regulation: That public regulation of the acts and practices of those who serve it is necessary appears well attested by the wide range of such control. To an impartial student of the matter, the regulation of such enterprises by public authority appears a direct sequel to the necessity therefor. Many of the older generation are familiar with the early railroad abuses, such as stock juggling, rebates, discriminatory rates, land and townsite promotions, and other evil practices which gave rise to widespread dissatisfaction among the general public. Our forefathers recognized that improved transportation facilities formed an invaluable adjunct to the commercial life of the nation, and were extremely liberal in giving aid to the construction of railroads by subsidies, land grants, and other agencies. These corporations owed their very existence to the aid thus given and the powers conferred on them by government. Nevertheless, many of the short-sighted persons who were then in control of railroad affairs flagrantly abused the confidence the public had reposed in them, forgot their duty to it, and gratitude was a word not in their lexicons. There followed an era of railroad exploitation, and in the end the public turned upon its erstwhile servants, and this generation has not seen the end of the restrictions that have been fastened upon the common carriers of the United States. Indeed, I am of the opinion that early conditions now have been reversed, and the public at present forms the oppressor. In substantiation of my position may be cited the Transportation Act through which Congress has largely deprived the railroads of initiative and efficiency in operation,

and, in effect, has turned the transportation systems over to the tender mercies of the labor unions, with the result that the remainder of the public now is paying the fiddler the high price of the political buncombe that is so profusely disseminated from Washington.

The early history of the street railway industry in the United States is much the same as that of the steam railroads, and many of the pioneers in that field brought infamy to themselves, ^{not} a worthy business, and financial distress alike upon the deserving and the undeserving. What the powers at Washington arrogate to themselves in the way of mismanagement of steam railroad transportation systems, many petty politicians of lesser calibre attempt in the cases of the street railways. Proof of this statement may be had in abundance right here in Chicago, where the traction question has furnished the political dust for blinding the electorate by self-styled "saviors of the people" for the past twenty-five years, and the platform on which mayors have been voted into office by an asinine public, ably assisted by the so-called "yellow" newspapers. The history of traction in New York, Chicago, and other large centers has been duplicated on a relative scale in nearly every other city in the country that has a street railway. What wonder, then, that public regulation now has clamped the lid on almost every form of street railway activity and practically throttled the industry? Nearly every municipality of any considerable size has had its parade to mark the opening of a street railway line, and later has

had presented the spectacle of the city officials beating the tom-toms summoning the populace to view the lingering death of the utility from starvation, brought on by inability to secure a just and reasonable rate for the transportation it sells.

Regulation in General: Regulation of public utility enterprises is practiced to a greater or less degree by numerous governmental agencies in the United States. There scarcely is a public authority that does not have some degree of control over them, from the district school or township official, who must give his consent to the use of a school ground or highway for a transmission line; the city officials who must grant the privilege of installing a street railway system of more or less magnitude; on up to the Interstate Commerce Commission, which has almost complete control over the vast railroad systems of our country. From the widespread character of regulation it easily may be inferred that it is not only necessary but desirable. To the policy of wise and just regulation of public utilities by commissions composed of able and fearless men I am quite committed. But to the ordinary type of political regulation, where punishment is meted out to corporations to satisfy the prevalent hatred of them which is born of ignorance and misunderstanding, or where rates are fixed in fulfillment of campaign promises, as sometimes appears the case, I am unalterably opposed. Such actions are not regulation, but irresponsible exercise of arbitrary power of such nature that they are repugnant to both our laws and the innate sense of justice with which the human

mind is endowed. Unless regulation be fair it can have no excuse for existence.

Regulation by Municipalities: Regulation of public utilities by municipalities generally has taken the form of embodying in franchise ordinances various provisions regarding the rates which might be charged by the company, or the amount and character of the service it should furnish. Where no superior regulatory authority exercises jurisdiction, municipal control is usually paramount, and still is widely prevalent. This control generally functions through action by the city or village council, but sometimes it is in the hands of designated city officials who, in turn, are responsible to that body.

To those who are familiar with the average city council in the United States there is little need to explain why that form of regulation has proved so dismal a failure. Americans are prone to elect to public office men whom they would not consider for an instant as employes in conducting their private businesses. Later they deplore the lack of results secured, and - elect another set of officials of the same kind. The average member of a city council has no special training for his important duties, and frequently is not capable of exercising any great amount of intelligence in handling technical questions. Sometimes his actions are governed by desire for party success, wish to be re-elected, or the more despicable motive of personal gain. In such cases the

evil results flowing from this type of regulation are far worse than the ills against which public control is supposed to protect.

For these reasons municipal regulation has become a by-word for political corruption and oppression of the worst sort, rendered all the more onerous because it is done under cover of the law, indeed, frequently by the blatant demagogue seeking office. The evils forced upon the public by official vendors of franchises, selected by the public to protect its rights, probably were never equalled by the predatory selfishness of those who purchased them in bygone days. For the time easily can be remembered by those not yet old when the possession of a franchise for a street railway or other utility was considered the Midas wand which transformed all the operations of the company into storehouses of gold flowing from the pockets of the community. Now many of the holders of such franchises have been disillusioned to their financial sorrow, and the corruption wrought through the agencies of this form of speculation is far less pronounced than formerly.

Born of experience, the conviction is strong within me that the limited term franchise commonly granted by American cities, is an unmitigated source of evil, one of which is stated above. I have spent an entire evening listening to the recital, by an attorney who handled franchise matters for a traction company, of tales in which corruption money was brazenly solicited by the paid servants of the people. The company and the public officials both were guilty, but of the two I am convinced the public officials were the worse offenders, for, in addition to their other trans-

gressions, they were traitors to those who placed them in their public positions for a specific purpose - that of protecting the very interests which they so grossly bartered away. It is a foregone conclusion the traction company would not have given the money for the favors it received unless it had been necessary. Hence, not only did the dishonest officials betray their fellow-citizens, but they fastened upon them extortionate rates, for it may be assumed that the company who thus secured the favors was out to make money, and that they exacted a return upon all money paid out by them, including that which was wrongfully used.

Franchise provisions also sometimes form sources of discrimination between communities. Examples of this may be seen in the case of an interurban railroad traversing a number of adjacent communities. The company may have franchises for varying periods, and when one of these expires it is forced to renew the grant on the best terms it can obtain from the municipality. In such cases the municipality frequently considers it good business to impose burdensome requirements upon the company in the way of paving, construction of depots, or other outlays. The other communities may follow a more enlightened policy and not require such outlays. In this event it is plain that the first-named community not only holds up the company, but it also takes advantage of its neighbors. For the company must earn the money to pay for these outlays, and the earnings must come from its passengers, who live in all the communities it traverses. Hence, if by reason of expiring fran-

chises a community is enabled to take undue advantage of the company, it at the same time takes an unjust toll from its neighboring citizens.

A further vital feature that greatly limits the usefulness of municipal regulation is the relatively small territory in which it can be made applicable, for the city can exercise no jurisdiction outside its boundaries. Nowadays, through the construction of telephone and telegraph lines, railroads, and transmission circuits, there are numerous cases in which a utility may operate in numerous municipalities. For example, the Public Service Company of Northern Illinois supplies electric service in more than 150 communities in the northern part of that state, while the Western United Gas Company furnishes gas services in about 65 cities and villages in the vicinity of Aurora, Illinois. If each of these communities attempted to fix the prices for which those services should be sold, it is manifest there would be a great variety of ideas on the subject, and it well might happen that persons living on opposite sides of the line separating two adjoining municipalities would be receiving the same service at different rates, clearly an unjust and discriminatory condition of affairs.

Consider also the case of a street railway company such as the Chicago & West Towns Railway Company which serves 11 cities and villages closely adjacent to each other and to the west boundary of Chicago. It is not conceivable that there could be such unification of ideas among the eleven that a just and proper fare could be placed in effect, or that any one of them could, of itself, perform

the work. As another example of this weakness in municipal regulation the writer calls to mind a small street railway system in southern Ohio which traverses two municipalities, one about seven times the size of the other. In that state the Public Utilities Commission has no direct control over the rates charged by street railway companies, and it came about that the management of the company secured the consent of the larger community to an increase in fares. However, the increase, justly deserved by the company, was blocked by the refusal of the smaller community to approve the higher fares. This certainly constituted a case of the tail wagging the dog, and, in effect, presented the spectacle of seven persons being governed or coerced by one, for that was the relative populations of the two places.

Regulation by State Authority: To overcome the defects inherent in municipal regulation, and to insure a uniformity of practice not otherwise obtainable, most of the states have enacted laws providing for state commissions having jurisdiction over the rates, services, and practices of public utility corporations. Hereinafter there is presented a table showing certain facts about these commissions. From this table it will be seen that the first state commission was organized about two years after the close of the Civil War. Most of the early commissions had powers solely relating to steam railroads, but, as the idea spread, the jurisdictions were increased until, at the present time, many of the state com-

missions have exceedingly broad powers over the corporations furnishing public utility services.

The creation of such commissions certainly forms a progressive step, inasmuch as the control of rates and services passes into the hands of an organization of sufficient magnitude to enable it to make a special study of the varied problems presented. These questions thus finally come to be handled by persons well qualified for the task, and also largely beyond the malignant influence of petty politics. While it is true that some state commissions occasionally so far forget themselves as to stoop to political rate making, nevertheless I am of the opinion such cases form the exception and do not detract from the value of the general principle of regulation by state authority. It is obvious that the cure for this type of commission is quite simple, and the remedy consists in electing the chief executive (if the appointing power be in him) from a class of men who will not stoop to the criminal folly of appointing upon such commissions men other than those who fearlessly will decide cases upon their merits regardless of the political exigencies of the time.

I am of the opinion that the general results secured through state regulation are fairly satisfactory. As many of the present disputed questions of principle become better settled it is certain their usefulness will increase, and the science of rate making will become more standardized than it now is. A great step in advance will be taken when laws will be enacted that require per-

sons serving as members of such commissions to qualify for their positions through some form of examination that will demonstrate their special fitness for the work. The farther such commissions are removed from politics the better it will be for the members themselves, the corporations over which they have jurisdiction, and for the public. There is no phase of economic life in the United States that is so wasteful as politics, or any agency that has as great a percentage of loss between input and output. There should be no "underground connection" between such commissions and political leaders. I do not have any fear of corruption of the membership by the so-called "interests". The lack of efficiency in such organizations is almost invariably due to the meddling of political leaders.

Regulation by Federal Authority: Principally to enable due provisions to be made for the regulation of interstate traffic on common carriers (these powers being beyond the authority of the states) the Congress created the Interstate Commerce Commission in 1887. At first the organization was weak in many ways, possessed but little authority, and did not exercise that to its full extent. But of late years the Commission has grown in magnitude and jurisdiction until it now overshadows anything of the kind in the United States, possessing, as it does, powers that are almost plenipotentary. Congress and the courts have stretched the meaning of what comprises interstate traffic until now it includes practically all transportation for profit or pleasure. However, to the credit of

the Interstate Commerce Commission, it may be said that in the main its powers have been exercised with circumspection and that the work done by it is praiseworthy. Its control over rates and services furnished by interstate carriers now is practically absolute, the Esch-Cummins Transportation Act having removed practically the last vestige of authority from the state commissions insofar as the railroads are concerned.

PUBLIC UTILITY RATE MAKING

Underlying Principles: The general theory underlying the regulation of the rates charged by a corporation furnishing utility services is the protection of the public against unreasonable charges, secure freedom from discriminatory practices, and to insure a uniformity of fair dealing that was not had under the former competitive system. It has been found by sad and costly experience that competition in public utility services is unprofitable to the public and disastrous to the corporations which engage in it. The writer has in mind a small city in western Illinois that at one time had two gas companies, although the population 20 years later was only 3,500, a community too small to support even one concern of that kind. The result of such competition was financial disaster for both companies, although they managed to exist in a

state of semi-starvation until absorbed by a large company having a centralized management and affording inter-community service through one controlling organization. Even under the more favorable circumstances thus surrounding the operation of the plant it could scarcely exist. In such a case the functions of a regulatory commission could have been exercised with profit to the public, for had such a commission been in existence it would have been difficult, if not impossible, for a second company to have secured the necessary permission to operate in the town. Hence the public would have been better served by the one company, and the stockholders of the second company would have been saved from loss thus occasioned by wasteful competition.

But the public is not the one which needs all the protection in the dual relation of corporation and public. For it frequently happens that the corporation would become the prey of conscienceless politicians were it not for the protection afforded by the wise provisions of a public utilities law administered by a fearless and upright commission. Should the commission prove recreant to its duty, then the corporation has its redress in the courts. However, it is plain that the controlling principle of rate regulation by public authority is the protection of the public against rapacity on the part of the corporation, and to stand as a barrier between the latter and the selfish schemings of political grafters. Protecting the corporation against the oppressions of politicians is but another form of defending the public against itself, for,

were it not for faithless public servants there would be little need for such protection.

Rate Making by Municipal Authorities: Regulation by municipal authorities is about the oldest form of governmental control. This arises principally from the fact that about the oldest public utilities were gas and water companies, both of which have more than a century of history. Naturally these companies operated in the beginning well within the limits of incorporated places, and quite as naturally it was seen that it would be of advantage to the citizens if the companies were permitted to make use of the streets in order to lay their mains. As a matter of fact, there was little alternative, as it readily is seen that it would have been a practical impossibility to have constructed the distribution on private property. Quite properly the municipality retained control of the streets, and also thriftily drove the best bargain it could in the way of low rates or payments for the use of the public property.

The plan worked quite well at the beginning, as the enterprises were new, and it could not be foretold just what the results would be in a financial way. In many cases the companies were prosperous from the outset, some of them unduly so, and this circumstance aroused the envy of those companies who were less fortunate, or the cupidity of the greedy. In the end either one or the other, or occasionally both, proved the destruction of the unfortunate company. The envy of competitors produced rate fights which were as disastrous to the instigators as to the defendant, and the greed aroused

in the politicians was foolishly sought to be satisfied by recourse to bribery, the payment of protection money, or other device of shady character. The general result was chaos and financial disaster to many companies which otherwise might have been fairly successful. In the end these conditions have reacted unfavorably upon the class of men who were responsible for them, for it has come about that relief has been quite generally sought by taking away from municipal authorities the powers which they showed so little capacity to intelligently exercise.

As previously stated, the authority of a city council is confined to the territory within the corporate limits of the municipality. It now has come about that many street railway companies, gas companies, electric companies, and telephone, telegraph, or other companies transact their affairs and furnish services far outside the limits of any one city or village, and it is readily seen that the scope of authority possessed by the city or village council is utterly inadequate to cope with such situations. Hence recourse must be taken to authority of greater extent, and this must, perforce, lie in the state. Under such circumstances the loudly proclaimed principle of home rule must step aside for regulation or authority that is more effective. And this is exactly the thing that has taken place, for there has been but an exceedingly limited return to the older form when once the newer has been tried,

Regulation by State Authority: With the expansion of utility enterprises, particularly the railroads, it early was seen that control by municipal authority was impracticable, and there arose

a demand for more effective supervision. This was met in the early days following the close of the Civil War by the creation of one or two state commissions, whose powers were practically confined to questions affecting steam railroads. Among the first, if not the first, to recognize the developing principle of state regulation was the commonwealth of Ohio, which on April 5, 1867, enacted a law for the supervision of railways and telegraphs. The enforcement of the provisions of the act was placed in the hands of the commissioner of railroads and telegraphs. A somewhat similar law was passed by the state of Massachusetts in 1869.

At first the idea was received with disfavor or with bitter animosity, and was denounced as socialistic, burdensome, tyrannical, or by other opprobrious terms. But the seed thus sown has grown hardier with the passing years, and the authority of state commissions, extended and enlarged, has now come to supersede that of municipalities in practically all the states of the Union with unimportant exceptions. While the powers of these commission vary widely, as shown by the table hereinafter presented, nevertheless they recognize the fundamental principle of paramount authority being vested in the state, and it is well within the bounds of probability that, as the principles of rate making become more settled, the authority of the weaker commissions will become much more extended and of greater benefits to the citizens of the commonwealth. A glance at the table will show that the weaker commissions are generally confined to the more backward states as regards economic progress.

Organization of State Regulatory Commissions: Generally speaking, state regulatory commissions are composed of from three to seven members, commonly appointed by the governor of the state, although some are elective. Usually no specific qualifications for the position are required by statute, the legislatures evidently preferring to rely upon the good sense and discretion of the chief executive. Where the people choose a high class executive for governor, the plan of appointing the commissioners by that official appears to work out reasonably well. On the other hand, where a weak or incompetent executive is chosen his unfitness is practically certain to be reflected in the appointments made by him, and this applies with particular force to members of the commission. These men stand in the same relation to the public as do the courts, and they should be equally above suspicion as to character or competency.

Requirements for Membership: As above stated, there commonly are no specific requirements provided by statute for membership on the state commission. It must be generally admitted that no position in the state calls for a higher type of man than does that of commissioner, and every effort should be made to see that only persons of the best character and attainments should so serve. In my opinion, the personnel of state commissions would generally be materially improved by requiring members to pass a rigid test before an impartial tribunal as to their qualifications for the place. Quite generally the minor positions are filled from civil service lists, and this is a material aid in holding back the aggressions

of politicians seeking positions for friends regardless of the fitness of the applicant. If this plan were adopted there would be incentive for high-class men to seek the positions, and men of low caliber, who are sometimes appointed on such commissions by governors seeking to repay political obligations, would have no chance of obtaining the places.

Further, if membership on the commissions were made the result of special fitness therefor, there would be but little weight to the common charge that a commission is playing politics in handing down this or that decision. If the members of the commission did not owe their positions to politics they would have little or no reason to play politics in rendering their decisions. If the commission is composed of high-class men it will give a good account of itself, and will deserve and have the confidence of the electorate. The salaries paid members are usually sufficient to attract men of ability, and if they are assured there is a proper future in the work there will be no dearth of suitable material. Under present conditions, when it is practically certain an appointee must relinquish his position after the next gubernatorial election, there can be no great incentive for capable men to accept the position.

Also, there is no doubt in my mind that the engineering profession should be well represented upon the memberships of commissions. Practically eighty-five per cent of the questions which a commission must decide involve engineering problems, nevertheless

the profession is represented but sparingly on state commissions. To me it appears this situation is one calling for the attention of the national societies to the end that the claims of the profession in this direction may be more fully considered.

The costliness of having unfit men direct public affairs is strikingly illustrated in the present railroad situation. Here we have the spectacle of men laying down laws and rules for the conduct of the greatest industry in the United States, yet probably not one of them ever had any more experience with a railroad than consists in riding over them on a pass. If voters were as insistent on qualifications in public officials as they are for fitness in their private businesses, the change for the better in this country would be miraculous. Certainly the public pays dearly for its carelessness in this respect, but there appears little relief until such time as the present mounting cost of government reaches a height sufficient to cause considerable thinking on the part of those who pay the taxes.

Regulation by Federal Authority: Following the lines first laid down by some of the states, and after prolonged consideration of the matter, the Congress created the Interstate Commerce Commission in 1887. At first its powers were small and were hesitatingly used. But the general effect and work of the commission were good, its results were helpful, and from time to time its powers have been amplified until now they are almost czar-like over the rates and services furnished by the common carriers throughout the

United States. The commission now consists of nine members, each appointed by the President for six years, and they are amply furnished with competent clerical and technical forces to supply the need for trained assistants in carrying out the intricate work of the organization. Almost complete supervision is maintained over the activities of the common carriers, and I am of the opinion it can be truthfully said that in the main the work of the commission is capable and to be highly commended. However, of one thing I am convinced, and that is that the commission should have one or more trained engineers on its membership, for a large part of the problems involve engineering questions, just as do similar matters before the state commissions.

Without doubt the most extensive valuation program ever undertaken is now approaching completion by the Interstate Commerce Commission. I refer to the appraisal of the properties of the common carriers, begun by the Division of Valuation of the Commission in 1914, and carried forward continuously since that time. All of the property of each carrier was inventoried in the field by government forces, and to the quantities thus secured there have been applied prices representing approximately the cost of reproducing the property at the time of the valuation, commonly the 30th of June of one of the years subsequent to 1913. In this work the Commission was ably assisted by the carriers themselves, who maintained extensive valuation departments, and assisted each other in presenting the various phases of the questions involved. Able and voluminous briefs have been presented before the Commission by the railroads

organized into the Presidents' Conference Committee, and these arguments have dealt in an exhaustive way with the contentions of the carriers, as seen through their eyes. Likewise, the state commissions, through their national organization, have presented many able briefs and arguments in opposition to the claims of the carriers, or upon the questions raised by the procedure of the Commission.

From the appraisals thus prepared by the commission, tentative valuations of certain properties have been made by it. Already have some of the rulings and decisions of the commission concerning valuation questions found their way into the courts in an effort to clarify the present situation with respect to some of the vexatious questions involved or the principles at stake. From out the mass of conflicting opinions thus presented there doubtless will come from the courts decisions which will set at rest many of the controversies that have raged since the beginning of public utility valuations. If it shall come about that the Supreme Court of the United States decides certain of the fundamental issues involved, there can be no doubt that the whole atmosphere surrounding such appraisals will be cleared, and there will not exist the present confusion and uncertainty of procedure respecting numerous phases of valuation matters.

VALUE

General: In the broadest sense, value may be defined as the worth of an object. While this worth commonly is measured in money, nevertheless such measure is not an essential, as an object of worth frequently is exchanged for another article of the same or different value. It is plain, then, that in such a transaction, money has not been used, even indirectly, as the yardstick with which to measure the relative values. However, for the more restricted purposes of this article, worth may be defined as the relative money value of an article or combination of articles into a property.

Value for Various Purposes: It is a matter of common knowledge that the same article may have differing values, depending upon the uses to which it can be put, the desire of some one for its possession, the amount which it can earn, or some other cause. Frequently sentiment may play a considerable part in fixing the worth of an article. Thus, a tract of land which forms the homestead of an aged couple may have a much greater value in the eyes of the owners than it would if it were owned by recent comers, for to the former the associations connected with the place comprise a value that is practically lacking in the latter case. A painting may be priceless to the owner because it was done by one holding a high place in his affections, although the work itself is wholly mediocre.

Location also plays an important part in determining the value of an article. Thus, a dwelling may be placed in different neighborhoods and its value will rise or fall in proportion to the desirability of the neighboring structures. A store may be a great success if placed in a particular location and an absolute failure if operated in a locality unsuited to its requirements. Niagara Falls would have little or no commercial or scenic value if placed in the heart of Africa. Similar examples might be given almost indefinitely, but the above will suffice for our purpose.

Just as any other article or property has differing values at different times or locations, or for different purposes, so does a public utility property have various values, depending upon the purpose for which the value is sought. Thus, the property may have a value for purchase or sale; it may have another for taxation; and it may have a rate making value. Each of these may be, and probably is, different from either of the others. Thus, the property may be what is commonly termed a money maker, that is, one that has a high earning capacity. This attribute will make it attractive to a possible purchaser, for he can buy it with the reasonable assurance that his money is safe and will return him a fair rate of interest upon his investment. Or it may be that he is of the opinion that if certain changes in operating methods shall be put into effect that the present earning capacity may be considerably increased and therefore his earnings be proportionately enhanced. In such cases it is quite clear the property will have a rather high

market value, or, which is the same thing, a superior worth for purposes of purchase or sale.

On the other hand, the property may have small earning power, arising from a number of causes; it may be in a decrepit condition and incapable of rehabilitation except at prohibitive expense, or there may be other reasons why the property is undesirable from the point of view of the investor. In such cases it is evident the property would have a low value in the eyes of a prospective purchaser. Further, because of the varying judgments of individuals, the property might have as many values as there might be persons to whom it was offered for sale. Hence, the market value of the property appears an extremely variable quantity, although the differences may fall within rather narrow limits.

Condemnation Value: Some classes of property, particularly land, may have a so-called condemnation value, which, in a sense, is closely akin to market value. For example, a railroad company commonly has the power of eminent domain, that is, it may take possession of real estate upon payment of such sum therefor as may be fixed through court procedure, and this power is frequently made use of where the owner will not sell. The condemnation value of land is usually more than the average market worth of similar lands in the vicinity. This is so for a number of reasons, chief among which is the prevalent prejudice against railroad companies. It is easy for a skillful lawyer to arouse this prejudice in the minds of a jury, or to play upon their sympathies in such manner that his client will secure a sum for his property that is consid-

erably in excess of its true worth as measured by other lands in the vicinity. In fact, the common estimate of railroads is that land acquired through condemnation proceedings costs, on the average, about two and one-third times as much as its true value as measured by that of similar lands. With other classes of public utility properties this value is not so much in evidence, as they usually do not possess the power of eminent domain, although, in certain cases, it may be given them in Illinois by the action of the state commission exercising regulatory powers, at present called the Illinois Commerce Commission. However, the condemnation value is an element of cost in many cases, and therefore is one with which we have to reckon.

Taxable Value: The value of a property for purposes of taxation may be entirely different from that for other purposes. Yet it is a common experience to have attorneys attack a valuation of a public utility property that was made for rate purposes because it is higher than the value upon which the company has paid taxes in the past. It is a matter of common knowledge that but little property is valued at its full worth for taxation purposes. The attorney who attacks the value of a property, made for rate purposes, commonly forgets that the house he occupies is taxed upon a value far less than the sum for which he could sell it in the open market. Farm lands notoriously are taxed upon values far less than they could be sold for, and the same thing is true of most articles of personal property. In my opinion there can be no particular

objection to making the taxable value of a public utility property the same as its rate making worth, but if this is done, all other property should be taxed upon a corresponding basis. Let the farmer pay taxes upon the full value of his lands and chattels, the dweller in the city do the same, and there then can be no injustice in requiring the public utility enterprise pay taxes upon its full value. So long as there is no discrimination there can be no injustice, but there is no fairness in singling out the property of a corporation, making it pay taxes upon its full market worth, and then permitting the holdings of other citizens to escape paying taxes on all except a portion of their value.

Special Values: Sometimes special or unusual values are claimed to attach to certain property by reason of special conditions surrounding them. Thus, in a desert, a bountiful spring might have a very high value, while in a well-watered region its worth would be a great deal less. This value would depend upon the marketability of the product and the opportunities the owner might have for taking advantage of the needs of his patrons. Similarly, should another railroad desire to cross the Rocky mountains in southern Colorado, the Royal gorge might easily assume a fabulous value in the eyes of the railroad now traversing it because this is the only practical route along which the new road could be constructed. And this value might be held to accrue despite the fact that it cost the present occupants comparatively little to acquire their existing rights. However, as a general rule, these

special values do not attach to the value of a public utility property where that value is determined for rate making purposes. Thus a water company would not be permitted to capitalize against its consumers any excessive value by reason of the fact that it owned the only available source of water supply in the community. This is especially true in those cases wherein the special value claimed represented no investment or sacrifice on the part of the company. In general, public utility properties may not capitalize the necessities forced upon a community because of natural conditions which tend to insure a monopoly or which accrue to the property without expense to the owners or other sacrifices upon their part.

Rate Making Value: We come now to that value of principal consideration in this article, that is, the rate making value of a public utility property. Briefly, this is the sum upon which competent authority fixes as the amount upon which the owners of the enterprise are entitled to a reasonable return from its consumers in the way of rates for the services it furnishes, provided always, these rates are just and fair. While it is a comparatively simple matter to define this value, nevertheless its ascertainment is one of the most complex problems with which we have to deal in rate cases, and while there appear signs of progress in settling some of the debated questions there still is much to be done before their status is exactly determined. It is in the effort to somewhat clarify the situation that the present discussion has been prepared, and in the final pages thereof argument is made for a procedure that

will greatly simplify the question and render possible the settlement of many of the complex problems now confronting appraisers and regulatory authorities.

Ascertainment of Rate Making Value: In subsequent pages there will be discussed certain elements of value in the property of a public utility enterprise. As previously stated, practically all the states now have a regulatory commission in which powers are vested to fix the rates that may be charged for the services furnished by public utility corporations. As shown hereinafter, these commissions have extremely varied opinions concerning the proper basis for determining rate making value, and so pronounced is the disagreement that discord probably forms a better term for describing the existing situation. Some of this is due to a lack of understanding of valuation questions by political commissioners who represent little more than the potential ability to control a portion of the vote at a forthcoming election, while a considerable portion has been injected by the efforts of engineers and utilities to get as high a value as possible in a particular case, forgetting that many times the value of a property is secondary in the determination of rates. Then, too, not a little of the difficulty is due to the courts, which, in the manner customary to them, have failed to lay down rules of specific application. This arises from the fact that too frequently judicial decisions deal in generalities, and these generalities are taken too seriously or too narrowly by others who seek to interpret them. While I am far from criticising the courts, nevertheless I trust that the time is com-

ing when our courts of last resort shall lay down some definite rules for guidance in valuing properties, for, in the final analysis, it is they who control the situation. As these matters become better understood I am sure that court decisions will reflect the progress made toward final disposition of the many questions which now arise. Inasmuch as it is the courts of highest jurisdiction to which we must look for final disposition of the questions, we logically may inquire as to just what has been done by them.

Among the earliest decisions handed down by high courts concerning questions of valuation is that by the United States Supreme Court in the historic and epoch-making *Smyth v. Ames*. In 1893 the Nebraska legislature passed an act classifying and prescribing certain maximum rates for freight within that state. An action was brought by the Union Pacific, the Chicago & North Western, and the Chicago, Burlington & Quincy railroads to enjoin the enforcement of the act, principally on the ground that it constituted confiscation of property in violation of the Fourteenth amendment to the Federal constitution. The matter finally found its way into the Supreme Court of the United States, which, among other things in an opinion handed down March 7, 1898, stated:

"We hold, however, that the basis of all calculations as to the reasonableness of rates to be charged by a corporation maintaining a highway under legislative sanction must be the fair value of the property being used by it for the convenience of the public." 169 U. S. p. 466.

In 1906 and 1907 the legislature of Minnesota enacted two laws prescribing maximum charges for freight and passengers, and the Railroad and Warehouse Commission of that state issued two

orders relative thereto. The Northern Pacific, the Chicago & North Western, and the Chicago, Burlington & Quincy railroads brought an action in the courts to restrain the enforcement of the acts and of the orders of the Commission. The matter found its way to the Supreme Court of the United States, which, in an opinion down in October, 1912, among other things, stated:

"We concur with the court below in holding that the value of the property is to be determined as at the time when the inquiry is made regarding rates. If the property which legally enters into the consideration of the question of rates has increased in value since it was acquired, the company is entitled to the benefits of such increases. This is, at any rate, the general rule." (Minnesota Rate Cases, 230 U. S. 352).

The above excerpt forms a portion of the famous Minnesota Rate cases decision, and while the general principle thus laid down appears explicit, nevertheless some of the collateral issues involved have caused endless speculation as to just what the court meant. This is particularly true of that portion of the decision relating to land values, for, from the words of the court there have been so many meanings drawn that it is evident the matter was not explicitly decided.

A recent decision of the Illinois Supreme Court also deals at length with many questions involved in rate making valuations. In 1916 the Public Utilities Commission of Illinois entered an order reducing the rates for gas services furnished by the Springfield Gas and Electric Company. This order was entered after exhaustive evidence had been taken by the Commission covering costs of operation and the value of the property. In its order the Commission

fixed a value (Public Utilities Reports, Annotated, 1916A, page 281) which the company considered unreasonably low, approximating rather closely the depreciated original cost of the property, and the matter was appealed to the Sangamon county Circuit court, as prescribed by statute. Subsequently the case was carried to the Supreme Court of Illinois, which, in an opinion handed down in 1920, among other things stated:

"Appellee contends that the only equitable basis for determining value for rate making purposes is the cost of reproduction new, less depreciation. This contention cannot be sustained. The basis of all calculations as to the reasonableness of rates to be charged by a corporation maintaining a public utility under legislative sanction must be the fair value of the property being used by it for the convenience of the public, and in order to ascertain that value the original cost of construction, the amount expended in permanent improvements, the present cost of construction, the probable earning capacity of the property under the particular rates prescribed by the statute, and the sum required to meet operating expenses, are all matters for consideration, and are to be given such weight as may be just and right in each case."

"It would be equally as unfair to the consumer to fix the rate at a figure which would produce a reasonable income on a value determined by the cost of reproduction new at a time when cost of construction was abnormally inflated, as it would be unfair to the public utility to compel it to serve the public for a rate that would produce a reasonable income on a value determined by cost of reproduction new at a time when the cost of construction was abnormally low. Therefore, it cannot be laid down as a rule without qualifications that cost of reproduction new, less depreciation, is the only basis of valuation for rate making purposes. It is equally true that the original cost of construction, less depreciation, cannot be held to be the only proper basis for determination of value for rate making purposes. As we have pointed out heretofore in this opinion, the weight of authority is that every element having any bearing on the situation must be considered in the investigation and then sound business judgment applied to the determination of a valuation that is fair and just to the consumer and the utility. Each case must be considered on its own merits and such result of value arrived at as may be just and right in each case. It is not a matter of formulas, but there must be a reasonable judgment having its basis in a proper consideration of all relevant facts. We consider any value a fair value which fair

and reasonable men would say ought to be attached to the property, under all the circumstances of the particular case, for the purpose of measuring a return which the public should pay to the owner." (Page 222).

Insofar as Illinois is concerned, it is plain that the law as thus laid down by the highest tribunal of that state must govern. It will be observed that the decision is largely affirmation of rules previously laid down by the United States Supreme, and consequently has the sanction of the highest judicial authority in the country. While, for reasons laid down hereinafter, I do not fully agree with the court as to what constitutes fair value, nevertheless I am constrained to admit that it is supported by the weight of authority. Particularly do I take exception to the stress laid on the value determined as the result of the judgments of fair and reasonable men. This same theory has produced an amount of demoralization in the determination of rate making values that is scarcely conceivable, for it frequently has been used as a cloak to mask the ignorance or incompetency of those who fix the aforesaid value. Under this doctrine a property may be gifted with any number of "fair values", for they depend upon the personnel of the commission or other organization which fixes that value. As a practical matter a rate making value should be determined upon premises that leave but a small margin for the injection of the element of judgment, for this factor is much too uncertain a quantity and too liable to abuse at the hands of irresponsible political rate fixers. As shown hereinafter, there is one concrete fact that is determinable within very narrow limits for practically

all properties, and this fact is the investment in that property. One fact is always worth a hundred theories, and far exceeds in value the "guesstimates" of men having little or no experience in the technical fields of public utility management. Indeed, it has been but a few weeks since the worthlessness of such judgments(?) was strikingly demonstrated in Illinois when they promptly were overruled by the judgment of the Federal court.

Perhaps the whole situation may be summed up in the words of Dr. Thomas Conway, Jr., Professor of Finance, University of Pennsylvania, who, in an article published in AERA for January, 1922, at page 486, states:

"The fair value of a property, therefore, is a composite result, arrived at by the exercise of judgment, taking into consideration the original cost of construction, the market value of the stocks and bonds outstanding, and the cost of reproduction new, less accrued depreciation, of the property in question. As the Supreme Court has said, each of these elements is to be given such weight as is just and right in each case. In determining the reproduction cost new, it is necessary to start with present day prices, deducting therefrom accrued depreciation calculated on the same price basis or, if pre-war prices are used as the basis of the reproduction estimate, it is necessary to determine not only the accrued depreciation but also the appreciation which has occurred, thereby, in effect, arriving at the same result."

With the conclusions of Dr. Conway concerning the present situation as regards valuations of public utility properties, I agree. But, as above stated, I am far from accord with the general doctrine that the element of "judgment" should play so prominent a part in the determination of the value of a property. This theory has been advanced by commissions almost from the beginning, in many cases to cover up their own shortcomings in the way of a judgment they do not possess, for many of the persons endowed by law with

with authority to fix values have only the remotest idea of the elements of the subject. They lack the technical training, they lack any experience in the particular line of business over which they are called to preside, and, worst of all, they sometimes lack backbone to give a square deal on the questions that come before them. In such cases how can the results of the "judgment" thus exercised form the groundwork of a just decision in matters so important as the rates which a public utility shall charge for its services?

There is a theory, far too prevalent in this country, that election or appointment to public office confers, in some mysterious way, an infallibility in the opinions and judgment of the official. This mischievous and pernicious theory is largely responsible for many of the gross failures of such officials - failures which go unpunished because the victims are afraid to complain, or else because there is no adequate check upon the doings of those who fill the office. If the public could be brought to exercise a fraction of the care in choosing its public servants that it does in selecting employes in private businesses, there would be such a cleaning out of state houses and city halls as never has been witnessed in this country. For, after all, the administration of public office is nothing more nor less than a business proposition, and the persons who fill such offices should be required to devote their entire time to the duties for which they are paid instead of building up a political machine or giving their time to their priv-

vate affairs, as is commonly done in the United States.

Elements of Value: The total value of any property is made up of a number of correlated factors, consisting usually of the physical articles comprising the plant; the costs of installing these articles, particularly those costs which cannot readily be allocated to the article; and certain other elements that are recognized as existing, but which cannot be as readily ascertained as can the preceding costs. For the purposes of this articles these several elements may be conveniently grouped under three heads (1) the physical elements, comprised in the articles which may be seen, inventoried, or otherwise recognized because of their physical attributes, (2) overheads, or costs of engineering, superintendence, interest, taxes, injuries and damages, organization, and similar expenses during construction which cannot be readily allocated to particular articles or classes of property, and (3) intangibles, or those elements of value which commonly are recognized as attaching to a property, but which cannot be conveniently segregated as can other costs. To this last-named class of values is commonly given such names as going value, cost of attaching the business, or similar name. Much has been written on the nature of intangibles, methods of their ascertainment, and the propriety of including them in rate making values, but an extended discussion of the question is beyond the limits of this article.

Appraisals: An appraisal of a property consists of an ascertainment of the cost of that property at some specified time and upon one of a number of bases of pricing. It will be noticed that

I have used the word cost instead of the more common word value, and this has been done after careful consideration of the matter. As commonly used, an appraisal merely lists all the various articles comprising a property, together with the overheads and intangibles pertaining thereto. To this list of articles are applied prices that represent the costs of such articles at or during a specified time, and the preparation of such data constitutes the true function of the appraiser. This appraiser commonly has no authority to determine value for rate making or any other purpose. If the purpose of the appraisal be for rate making, then the regulatory authority fixes the value of the property. Or, if the appraisal is for use in a purchase or sale case, the value of the property may be said to be the amount paid for it, or for which it is sold, depending upon whether the viewpoint of the buyer or the seller be taken.

An appraisal of the property is a practical necessity in nearly every rate making proceeding. From the quoted decisions of our courts it is plain the company is entitled to a reasonable rate of return upon the fair value of its property, and this principle of rate making is so firmly fixed that it no longer is open to question. True, there occasionally may be a property on which a company could not earn a return upon any value which might be fixed for the property, and in such cases the preparation of an appraisal is of secondary importance. But in the great majority of such cases the company will protect its interests by having prepared

a proper appraisal of its property, and access to such will enable the commission or other regulatory authority to act upon the matter with due intelligence. Many companies have suffered financially by reason of their failure to make proper showing of their needs in the way of increased rates, and at the bottom of the inquiry rests the determination of the value of the property, for a return upon this value forms one of the major earnings to which the corporation is entitled. Hence, in any well-conducted rate inquiry, an appraisal of the property is of vital importance.

Usually an appraisal is made showing the costs of the property at some specified time, generally near the time of the inquiry. In many cases it is of advantage to compile the appraisal as of the beginning of the year for the reason that this time coincides with the beginning of the fiscal year of most companies. However, the appraisal may be made as of any definite time, but it usually will be found of distinct convenience if it be made as of December 31st of the year preceding the inquiry, and any additions or betterments made to the property from that time to the beginning of the inquiry shown separately.

Practical Making of Utility Appraisals: In the making of appraisals of public utility properties various methods are followed by appraisers, and the limits of this article preclude their description. However, it may not be amiss to describe a concrete case in point, and for that purpose there will be selected the street railway property of The Portsmouth Street Railroad and Light Company, of Portsmouth, Ohio. This company operates a street railway

and electric power and lighting business in Portsmouth and the adjoining village of New Boston, and an interurban railway from New Boston, Ohio, to Ironton, Ohio, a distance of 23 miles. On June 21, 1921, the city council of Portsmouth passed an ordinance in which it is sought to provide street railway service at cost, and on August 25, 1921, the village of New Boston passed a similar ordinance. These ordinances followed the lines of the modern "service at cost" franchises, and Section 1-c of the Portsmouth ordinance reads in part as follows:

"That after the effective date of this ordinance, and not later than December 31, 1921, The Portsmouth Street Railroad and Light Company, at its own cost and expense, shall cause an appraisal to be made and completed of all its properties and equipment which are actually used and are necessary in conducting that portion of its street railway permitted by existing and effective franchises of the city of Portsmouth, Ohio, and the village of New Boston, Ohio. The values to be used in making said appraisal and the allowances for depreciation shall be arrived at in the same manner as such items are arrived at in making appraisals of properties of similar public utilities of the State of Ohio."

The appraisal thus required was prepared under the supervision of the writer, and copies were duly filed as provided in the ordinance. In the preparation of the appraisal one of the first questions necessary to be decided was the basis upon which it should be made. For this purpose the Ohio Public Utilities Commission was consulted, this body being considered as constituting the highest authority on the matter in the state. Under date of November 17, 1921, Mr. L. G. White, chief engineer of the Commission wrote as follows:

"It has been the practice of this Commission since the rapid increase in prices due to the war to instruct the Commission's engineers to use the fair price obtaining during the five years preceding the date of inventory of the case in hand."

The foregoing information decided the basis of the appraisal, and the next step was the preparation of an inventory showing all the articles belonging to the street railway department. As a preliminary to this work, all the trolley poles were numbered. Then a party was sent into the field which carefully measured the tracks with a steel tape, at the same time making note of the location of all poles, frogs, switches, paving, and other fixed physical property. These notes were made in the same manner as commonly done on chainage surveys of steam railroad lines. The cars were inspected, and notes made of their condition, particularly the bodies, trucks, and motors. Buildings and their contents were enumerated, and finally a mass of data was compiled which gave the quantities and kinds of all articles comprising the physical property. These articles then were separated into the various classes required by the Uniform System of Accounts for Electric Railways, prescribed by the Interstate Commerce Commission, and officially adopted by the Ohio Public Utilities Commission on July 1, 1914.

In order to ascertain the conditions of the rails and ties, 25 holes were dug at random along the tracks, and careful inspection made of the rails, ties, ballast, and paving. Holes were drilled through the webs of rails in order to ascertain whether rust had decreased the thickness, and the wear on the heads of the rails due to the passage of cars and vehicles was measured to the nearest 1/64th of an inch by means of an apparatus designed specially for the purpose. The wear of the trolley wire was measured by calipers at various places. From the measurements thus made

deductions were drawn concerning the probable remaining lives of the various articles, thus comprising a determination of depreciation upon the basis of inspection.

To the quantities thus ascertained there were applied prices representing the average costs of the various articles during the five years preceding the time of valuation. Inasmuch as the appraisal was made as of December 31, 1921, this period comprised the five years, 1917 to 1921, inclusive. These average prices were determined by ascertaining from the records of the company the cost of a given article in each of the five years, and the arithmetical average of these costs formed the price applied in that case. In some instances where the article was not purchased in each of the five years, correspondence was had with manufacturers or dealers who customarily supplied the company with that class of equipment. The appraisal included all property possessed by the street railway department, and this was subdivided into that actually used in the operation of the road, and that which was not used in the production of the service, that is, into operating and non-operating property. The appraisal also showed the present or depreciated cost of the property, this being determined by deducting from its cost now the depreciation which had accrued to the time of valuation.

Bases of Appraisals: In seeking to determine the fair value of a public utility property there have arisen great differences of opinion among authorities as to just what constitutes the proper basis of ascertaining that amount. Discussion of the reasons

for such differences are beyond the scope of this article, and it must suffice to present certain prominent features of some of the more widely used methods of appraisal. Of first rank among these, in my opinion, is that which seeks to determine the actual investment in the property.

Original Cost to Date: This basis of appraisal may be defined as the ascertainment of the actual investment in the property to the time of the valuation, excluding from consideration articles that have been retired or incapacitated for further service for other reasons. That is, under this method, the object sought is the determination of the actual cost of the plant as it exists at the time of the inquiry. This cost could usually be readily found from the Plant and Investment account if the books of the company had been carefully kept and proper corrections made from time to time for retirements and for additions and betterments.

Unfortunately, however, the books and records of the company usually do not afford direct information concerning the actual cost of the property as it exists at any particular time, and for this condition of affairs there are a number of reasons. In the first place most present-day companies are the outgrowth of much smaller concerns, the increase in size being effected through consolidations or the natural growth of the business. During this period of evolution the property may have changed hands a number of times, the system of bookkeeping may have been altered to suit the ideas of different men, or proper corrections may not have been made for

changes in the property during the years that have passed. During the process of evolution books and records have become lost or destroyed by fire, flood, or other mishap, have been misplaced, or become no longer available for other reasons. In brief, the record has not been kept up to date and no longer reflects the actual condition of the property. Then, too, the books may have been opened in the beginning upon some amount assumed as reflecting the actual worth of the property, the amounts of stocks and bonds issued, or upon some basis other than the actual cost of the property at that time. If this has been done, as frequently is the case, it is evident the Plant and Investment account will not show the actual investment in the property.

In any event, it may be said that the amount carried in this account seldom reflects the actual cost of the property. Were the opposite of this statement true, I am of the opinion there might never have arisen other methods of valuation, for it appears the general opinion of the ordinary citizen that the actual cost affords the true basis of appraisals. Inasmuch as the reasons for this opinion are subsequently presented in detail, further discussion of the matter at this place need not be indulged.

Historical Reproduction: Failing to ascertain the actual investment in the property from the books, recourse may be had to its ascertainment as nearly as possible by means of so-called historical reproduction. This basis of appraisal may be defined as the determination, as nearly as possible, of the actual investment in the property. For this purpose an inventory of the articles com-

prising the property is prepared, and to them are appended prices representing, as closely as possible to determine, their actual cost to install. Of necessity this method takes cognizance of the history of the property, the methods used in its construction, and the vicissitudes through which it has passed, hence the name.

The practical procedure of determining the cost of historically reproducing the property is identical with that hereinbefore described for the Portsmouth Street Railroad and Light Company, beginning on page 44, with the exception that, instead of applying the averages of prices during a term of five years, there would be used the actual cost of the article, as determined from the books and records of the company, or by other means. Judging by my experience in the matter, it usually is possible to determine quite accurately from the books the costs of about seventy-five per cent of the property, and the remainder must be estimated as nearly as it can be. The costs of the larger articles are quite commonly shown on the books of the company, and it usually is possible to closely estimate the costs of many of the smaller portions of the plant. For example, in a street railway system, the costs of the cars are generally reflected on the books, as are the amounts expended for the electrical equipment for the rolling stock. Commonly this portion of the property will account for about one-third of the whole. The costs of car barns, shops, and power houses are also generally known, and this accounts for a considerable portion of the whole. The amounts of rail, rail fasten-

ings, ballast, ties, bonds, trolley wire, poles, and similar articles are easily ascertained, and the costs of certain quantities of these are always shown on the books. For example, the cost of steel rails was almost constant from 1900 to 1916, hence it is clear that if we know the amount of rail it is easy to fix on a price that shall represent its actual cost within a very small percentage of error. The same is true of the other articles comprising the plant, and I am of the opinion the historical cost of reproducing a property may be ascertained within approximately two percent of the actual cost. For all practical purposes this may be considered the same as actual cost, and for purposes of rate making it is my opinion that the cost of historical reproduction is second in a minor degree only to the value of the actual cost method.

Cost of Reproduction at the Present Time: A method of appraisal having many adherents, and widely used in rate cases, is that known as cost of reproduction based on present prices. This method may be defined as the ascertainment of the cost of reproducing an identical property, using prices current at the time of the appraisal. This method has been much in vogue during and since the International War, although it has been in favor almost from the beginning of modern valuation practice. Possibly the reason for the favor with which it is looked upon by the owners of utility properties arises from the somewhat higher costs it gives as compared with the actual costs of the various articles. To some extent the

greater amount obtained by using this method of appraisal is offset by the fact that accrued depreciation is commonly deducted therefrom in determining the rate base. This practice appears in strict accord with the commonly accepted interpretation of the rule laid down by the United States Supreme Court in the famous Minnesota Rate cases, and quoted in part herein on page 37. Under normal conditions this deduction usually brings the rate making value of the property somewhere in the vicinity of the actual investment therein, and therefore, insofar as amount of money is concerned, does no great violence to the writer's contentions for undepreciated original cost as the proper basis for rate making. However, the difference in principle is very great, and it is upon principle that I oppose the reproduction theory above outlined. Moreover, during war time, the costs of all articles have so enormously increased as to render excessive the costs of reproduction of properties when those prices are used. In subsequent pages this matter will be more fully discussed, hence will not be considered at greater length in this place.

In the practical procedure observed in making an appraisal upon this basis there is no substantial departure from the methods already described for inventorying the property of the Portsmouth Street Railroad and Light Company, as set forth on page 44, except that, for pricing, costs applying at the time of valuation are used. Wherever the company has made recent purchases of an article

the price paid therefor is used in the appraisal, and this usually can be done in the cases of articles which are frequently purchased, such as ties, copper wire, poles, or similar articles. However, it frequently happens that the company has made no recent purchase of certain articles, either because they have not been needed, or perhaps it is a machine, a car, or similar class of equipment that has a comparatively long life and therefore is seldom bought. In such cases correspondence may be had with manufacturers of the same or similar articles, and the costs of small articles may be obtained locally in many cases. For many articles of trivial importance the prices may be deduced with sufficient accuracy from catalogues of firms dealing in that class of merchandise.

Ascertainment of cost of reproduction calls for wide experience by the appraiser if the resulting product is worthily made, for it calls for the exercise of mature judgment in determining the numerous questions that arise. It should be borne in mind that reproduction of a plant on other than an historical basis usually involves assumptions as to manner of doing the work, method of pricing, or other factor in the appraisal which it is impossible to reconcile with conditions existing at the time of the appraisal. For example, there may be involved the question of reproducing an old-style pump which no longer is made. It is evident that no assumption as to present conditions can exactly fit the circumstances surrounding the pump, and that either we must assume the cost of actually reproducing the pump at a cost that would be prohibitive,

use a price that will install a similar pump of modern type and having an equivalent capacity, or fix upon a comparative price, determined by comparing relative price changes of similar articles with that of the particular unit. For instance, if the cost of the above pump be known for a certain year, and the cost of a similar pump which is still made can be ascertained for the same year and also at the time of valuation, it is apparent that it will afford a reasonable degree of accuracy to assume that the pump of discarded pattern would follow the same relative price changes as would the other. In the absence of other data this plan may be some times used with advantage.

Reproduction cost at present prices has long been used as a basis for appraisals in rate cases, usually after making due allowances for accrued depreciation. This method has many friends and likewise many violent enemies, many of the latter having been made since about the latter part of 1916 when the abnormal price changes due to the International War were beginning to be felt. Indeed, many utilities and others have gone so far as to claim it to be the only method by which property should be valued. With this view I am not in agreement, for reasons which will be presented in subsequent pages, and in this attitude there appears support in certain court cases. In the Minnesota Rate cases, *supra*, the Court stated:

"The cost-of-reproduction method is of service in ascertaining the present value of the plant, when it is reasonably applied and when the cost of reproducing the property may be ascertained with a proper degree of certainty. But it does not justify the acceptance of results which depend upon pure conjecture." (230 U.S. page 452).

When compared with the actual cost of a composite property, its cost of reproduction, using present prices, varies greatly with the time of the appraisal. If we take a property that was 15 or 20 years old in 1916 and had made an appraisal of that property in 1916, we should have found a total cost-new about ten per cent in excess of the actual investment therein. Had we valued the same property in the same way in 1919, the time of peak prices, its cost of reproduction would have been at least double the actual investment. The writer has in mind a good-sized street railway system in Illinois wherein the cost of reproduction in the latter part of 1919 was found to be more than twice the investment in the property. Now that the era of falling prices has set in, the difference between actual investment and the actual cost of such a property is less marked, although in the early part of 1922 it still would have been about 60 percent greater.

Reproduction at Average Prices: To overcome some of the objections made to appraisals prepared upon reproduction bases and using war-time prices, there has been devised the plan of substituting for those prices unit costs that represent averages of amounts paid for articles during a term of years. This period, of course, may be for any particular time desired by the appraiser, but commonly is for a term of either five or ten years next preceding the time of appraisal. As shown on page 45 a term of five years next prior to the time of valuation is favored by the Ohio Public Utilities Commission. In many cases valuations prepared upon the basis of ten-year average prices have been used in other

localities. Almost uniformly such appraisals choose the five- or ten-year period immediately preceding the time of valuation, although there are occasional instances in which the same principle is invoked by using, say, the five-year period from 1912 to 1916, inclusive, or the ten-year period from 1909 to 1918, inclusive.

Average prices have the merit of leveling off excessive price changes, and this applies to abnormal sags in market prices as well as to peaks. In my opinion they are preferable to any appraisal made upon the basis of cost of reproduction and using prices current at the time of the valuation. This is because abnormal fluctuations in costs are not capitalized against either the community or the utility, and therefore injustice may be the less flagrant in the event a rate inquiry is brought at a time of rapid or excessive price changes.

In preparing an appraisal using average prices there is but little practical difference between the procedure for ascertaining the cost of reproduction at present prices and the reproduction cost on any other basis of pricing. However, in average cost appraisals there is the distinct merit of having greater latitude in the selection of costs. If either a five- or a ten-year period be chosen, it is certain that within that time a considerable part of the property has been installed or at least renewed, so that, particularly for the ten-year period, there is commonly but little difficulty in obtaining a proper range of prices. In articles of frequent purchase, such as poles, ties, copper wire, rail, meters,

and many others, purchases are usually found in each year, and sometimes several times in one year. In such cases the ascertainment of the average prices is comparatively simple, as all that is necessary is to take the arithmetical averages of a number of representative purchases and apply these averages to the quantities determined by the field inventory. Should articles like engines, pumps, cars, or other long-lived equipment not have been purchased within the period, then it is comparatively a simple matter to obtain them from manufacturers or dealers, especially where the company has purchased its supplies from only a few sources, as commonly is the case.

The reproduction cost of a composite property, determined upon a basis of five-year average prices will differ from the actual cost of the property by amounts dependent upon the five years chosen. If we take a property which was 15 or 20 years old in 1916, and determine its reproduction cost based upon average prices during the five years, 1912 to 1916, inclusive, we shall find its cost-new about 20 percent in excess of the actual investment in the property. If we use the five years, 1917 to 1921, inclusive, we shall find the cost new will be about 72 percent in excess of the actual investment in the plant. If we use the average prices prevailing during the 10-year period, 1907 to 1916, the cost new will be only about ten percent in excess of the actual investment, and if we use the ten years 1911 to 1920, inclusive, we shall have a cost about 30 percent in excess of the actual

cost of the plant. These relative costs will vary, of course, with the difference in utilities, but will afford an approximate idea of the differences between the several methods of determining reproduction costs.

Rate Base: In a rate-fixing proceeding the rate base may be defined as the amount upon which the utility may rightfully expect a reasonable return in the way of charges for the services it supplies. Such a definition naturally implies that this amount is fixed by a state or other regulatory jurisdiction in the matter, and, in reality, is the sum variously called "value of the property", fair value, or by similar term.

Included in the property which goes to make up the fair value are all articles commonly considered as comprising the operating property, that is, the equipment actually used in producing the services which the utility furnishes its consumers. Excluded from the rate base will be the value of articles which are no longer serviceable or which may have been used at one time but not now needed. Thus, a company may have a boiler pump which it has replaced with a more modern design or one of larger capacity, although the old one is still useful. However, usually the value of the old pump would be excluded from the rate base because it is improbable that it will be used again in the service. Also, a street railway track may have been useful at one time, but, owing to a change in routing of cars, it is no longer used. Unless the company could show a strong probability the track might again

be needed, its value would be excluded from the rate base under modern theories of rate making. On the other hand, the company may own a considerable tract of land which is not used at the present time, but which it holds for purposes of future development, such as the construction of a power station, gas tank, or other necessary facility in its business. In such cases, unless the amount of land so held is clearly excessive, its value is properly includible in the rate base. For the company is bound to use conservative methods in providing against its future needs, and it would be an unwise regulatory authority that would deny the right to provide reasonable quantities of land for future extensions.

Thus is brought out one of the differences between the rate making value of the property and its market value, or possibly the value for taxation purposes. For the rate making value excluding, as it does, all unnecessary property, may be substantially less than the market or tax value, for the two latter values do not distinguish between the operating and non-operating character of the articles unless they no longer have any value whatsoever. That is, in the last example mentioned, the land held in excess of the reasonable requirements of the company would not be included in the rate value, but it could be easily sold, and undoubtedly taxes are annually paid upon it.

Commonly the rate base for a particular utility is determined by the regulatory commission having jurisdiction after an exhaust-

ive proceeding wherein all interested parties are given the opportunity to appear and place in evidence all facts having bearing upon the questions at issue. Commonly the procedure before a regulatory commission is not confined to the strict lines of legal cases, the intent being to secure any and all facts that may throw light upon the matter. All evidence is presented under oath, and the statute prescribes severe penalties for willful misrepresentation of facts by any witness. In a typical rate case before a state commission the matter may arise upon petition of the company, a municipality, or a consumer of the services supplied by the corporation. Complaints as to rates or applications for increases are usually filed in prescribed form, although this is not necessary in order to satisfy the statute. Usually there is filed a brief statement supporting the allegations, and within a specified time, usually ten days, the commission will serve notice upon municipal authorities, the utility, or others likely to be interested in the case. The matter is set for formal hearing before the commission or some examiner appointed by it, and at these hearings full opportunity is afforded each side in the controversy to present all the facts in its possession. These usually comprise complete operating statements of the company for a number of years preceding the time of the inquiry, together with an appraisal of the property, the amounts of outstanding securities, and, in short, a complete history of the company and the results of its operations. After the close of the hearing each side is privileged to file briefs stating its particular views

upon the matter. Thereafter the Commission takes the case under advisement, and in due time renders its decision. Statutes commonly provide right of appeal to the courts through specified channels, and the issues in any particular matter have the same right of final determination by high courts as do other like causes.

In placing in evidence facts concerning the value of the property of a public utility there generally is engendered a spirited controversy, the utility seeking to secure as large a valuation as possible, and its opponents exerting their efforts to keep the figure as small as they can. Quite frequently evidence takes the form of seeking to disprove the claim of one or the other side as to the value of a particular article, as a gas tank, engine, bridge, or other article of property. Also, there frequently is controversy as to whether a particular piece of equipment is useful or necessary in the conduct of the enterprise, and much testimony is given in support of the various contentions. In general, it may be stated that the best interests of all parties are served where valuations upon two or more bases are placed in evidence. At least, such is the present status of the matter, although hereinafter attempt will be made to show that one only is necessary, provided, always, that that one is the actual investment in the plant.

Included in the property of practically every public utility there will be found articles composing the physical plant, hence designated as physicals; other elements of value which may or may not directly form a portion of the costs of the physical items, commonly called overheads, and a third class of values forming

elements of value not includible under either of the foregoing heads. These elements, such as going value, cost of attaching or developing the business, and similar values, are generally known as intangibles, and constitute the most difficult class of values to ascertain. While extended discussion of the various elements of value is outside the limits of this article, nevertheless brief mention may be made of some of the more salient features.

Appraisal of most of the physical items of the property is usually made without much difficulty, and consists principally in applying unit prices, determined upon some one of the bases hereinbefore described, to the several articles which go to make up the plant. Controversies concerning these articles commonly are limited to the question as to whether a particular piece of equipment is useful in the conduct of the business of the company, or whether it is not. Occasionally the value assigned to a particular unit may be attacked, but this forms the exception to the rule. Frequently disputes will arise as to the physical condition of the article, however, but this forms another question, though one that is directly related to the value of the equipment.

Land, however, forms an exception to the general statements contained in the paragraph next above, and commonly forms the object of violent controversy. As is well known, land is one of the most difficult physicals there is to value, principally because it largely forms a matter of opinion and because there is no

standardized market value for particular classes or parcels of real estate, as is the case with other plant equipment. In other words, each parcel of land is a law unto itself, and so many elements of uncertainty enter into its makeup of value that no one has been able to lay down any rules for ascertaining its worth. Apropos of the wide differences of opinion that may exist among reputable and disinterested persons, the writer recalls one tract of land along the Mississippi river which entered into a matter that came before the Illinois Public Utilities Commission. Testimony was offered in support of values for this tract that ranged all the way from nothing to \$15,000 an acre!

Among other things, in the famous Minnesota Rate Cases, the United States Supreme Court stated:

"Assuming that the company is entitled to a reasonable share in the general prosperity of the communities which it serves, and thus to attribute to its property an increase in value, still the increases so allowed, apart from any improvements it may make, cannot extend properly beyond the fair average of the normal market value of land in the vicinity having a similar character. Otherwise we enter the realm of mere conjecture. We hold therefore that it was error to base the estimates of value of the right of way, yards and terminals upon the so-called 'railway value' of the property. The company certainly would have no ground for complaint if it were allowed a value for these lands equal to the fair average market value of similar lands in the vicinity without additions by the use of multipliers, or otherwise, to cover hypothetical outlays. The allowances made below for conjectural cost of acquisition and consequential damages must be disapproved; and, in this view, we also think it was error to add to the amount taken as the present value of the lands the further sums, calculated on that value, which were embraced in the items of 'engineering, superintendence, legal expenses, contingencies and interest during construction.'" (230 U. S. page 455).

The rule thus laid down by the court specifically prohibits the use of multipliers and the inclusion of certain other auxiliary costs. The construction of the remaining portion of the excerpt

has been variously interpreted by the carriers, the states, and others interested in the matter. However, regardless of the differences of opinion in this respect, commissions generally include in the fair rate making value of a public utility property the fair present market value of lands, based upon the worth of similar lands in the immediate vicinity. This rule, which may be well considered as a conservative interpretation of the rule of the court, has been followed by the Interstate Commerce Commission in valuing the lands of the common carriers. As will be seen by referring to the table on a subsequent page of this article, most of the state commissions follow this interpretation of the rule of the court, hence the principal controversies that arise relate more to what constitutes the present market value of the land than as to whether that value, original cost, or some other cost should be used. In appraisals it has been the practice of the writer to ascertain the market value of adjacent lands from records at the county seat, measuring these values by considerations paid for the parcels. The values thus obtained are supplemented by opinion values of real estate men, bankers, or others having knowledge of local real estate values.

The elements of value commonly called overheads generally include engineering and superintendence, legal expenses, injuries and damages, interest during construction, and organization expenses of the company. While these elements of cost generally are incurred in connection with the installation of physical art-

icles of property, nevertheless the expenses thus incurred cannot usually be allocated to particular pieces of equipment. While the amounts of overheads form the subjects of frequent controversies in rate proceedings, their inclusion is proper upon the weight of authority. Two general methods are followed in determining the costs of engineering, for example, one, the use of a percentage of the cost of certain physical property, and, two, the cost of an organization estimated as sufficient to perform the necessary services during construction. Both methods have their proponents and enemies, but the limited length of this article prohibits discussion of the relative merits of each. Briefly, the writer prefers the synthetic method, that is, where the cost of the assumed organization is determined.

The third class of elements of value are the so-called intangibles, of which the well-known "going value" forms the most conspicuous example. Intangibles have ever been a fruitful source of contention in rate-fixing procedures, and probably will continue as the storm center of similar future matters. This probably arises because of the nature of the element of value, and also because it frequently is made the vehicle for the inclusion of preposterous "values" in an appraisal when it is a matter of common comprehension that no such values attached to the particular property in question. Probably the custom of injecting large hypothetical values through the medium of "going value" is largely responsible for the difficulties that almost invariably attend its introduction into a rate case. In other words, it is not so much

the existence of the element as the amount thereof that forms the source of discord.

Concerning this element of value the United States Supreme Court, in the Des Moines Gas case, stated:

"That there is an element of value in an assembled and established plant, doing business and earning money, over one not thus advanced, is self-evident. This element of value is a property right, and should be considered in determining the value of the property, upon which the owner has a right to make a fair return when the same is privately owned although dedicated to public use."

In commenting upon the intangible element of "going value", the Illinois Supreme Court stated:

"The element of value which is the subject of serious contention between the parties to this litigation is what is known as 'going value'. In view of the settled law on this subject the question is no longer open to discussion. That a going concern has a value over and above the value of the physical property is self-evident. From the nature of this element of value it cannot be arrived at with mathematical accuracy, but must necessarily be considered in the light of the facts in each particular case." (City of Springfield, ex rel, etc., v. Springfield Gas & Electric Company, 291 Illinois 222).

In view of the foregoing it appears clear that the element of going value must be considered in a rate determination. Many methods for determining this element have been proposed, but none has gained any considerable application, and it is beyond the scope of this article to discuss the merits of the different rules. Probably a simple rule that is as accurate as any now used is to allow approximately ten per cent of the value of the physical property, including overheads, for the element of going value.

Depreciation: Depreciation may be defined as the loss in

value of an article due to use, wear and tear, the lapse of time, action of the elements, obsolescence, supersession, or other cause. It is well known that practically all equipment used by a public service corporation, as well as that used by all other persons, is subject to deterioration from the above causes, and, despite all that can be done in the way of maintenance of the articles, they finally come to the end of their useful lives and must be replaced. Argument is not needed in support of the contention that depreciation exists, for all are familiar with its effects in their everyday lives. Nor can space here be taken to indulge in the various theories of depreciation and their application to particular cases. For present purposes it will be sufficient to point out that, in the preparation of the ordinary public utility appraisal, depreciation is commonly determined by one of two well-known methods, (1) inspection, and (2) by the use of mortality or life tables.

Under the first method the article is inspected, and suitable measurements are made to determine the amount of wear or possible loss of value. From the results of these observations and measurements the relative percentage condition of the article is determined as compared with its new condition. Having ascertained its physical condition the corresponding loss in value is obtained by merely multiplying the cost-new by the percentage condition obtained as above, making due allowances for scrap value, if such exists.

Under the second method the appraiser makes use of so-called life (or mortality) tables, which are merely tables showing the

probable serviceable lives of various classes of equipment under normal operating conditions, these lives being based on the experiences of engineers, operators, or others having to do with the particular articles involved. The age of a particular unit is usually easily ascertained from the records of the company, and this age, compared with the probable life of that article, at once furnishes its percentage condition, when the loss in value may be computed as in the preceding case.

Frequently a combination of the two methods is of service, especially in those cases where an article is subjected to unusual wear. Thus, ordinary lap-welded steel pipe may have a service life of eight or ten years when used under normal operating conditions for, say, water service. But the water may contain substances that quickly corrode the pipe, and it may fail to be of use during more than a fraction of its estimated probable life as disclosed by tables. Hence it always is the part of wisdom to inspect articles whose depreciated condition is to be ascertained in order that inconsistent results may be avoided.

The experience of the writer strongly inclines him to the usefulness of the life-table method, supplemented by inspection. In practice there frequently arises the case of an article which apparently has a long life when judged by the inspection method alone. Thus, a turbine engine may be apparently performing satisfactory service after the lapse of ten years, and the inspection method would place upon it a high percentage value. Nevertheless,

the general experience of manufacturers, engineers, and operators of such engines show that such machines are superseded after periods ranging from ten to twenty years. In this case, then, the use of life tables would give more consistent results. As an example of the absurdities to which the ill-advised use of inspection may sometimes reach, the writer has in mind the case of a steel water tank in which the appraiser fixed a value, determined by inspection, that would have given the tank a life of 200 years, clearly revealing a lack of understanding of the matter that was lamentable.

Other Elements of Value: In addition to the elements of value above set forth, there are certain others commonly included under the general heading of intangibles. Among these may be mentioned good-will, cost of establishing the business, financing the enterprise, value of strategic location, solidification of railway embankments, and others of similar nature. In a large sense these elements may be considered as merely modifications of the element of going value, hereinabove discussed, and they commonly are subject to the same legal and engineering rules of determination as that value. There is not space in this article to even attempt a discussion of the relative merits of their inclusion or exclusion from an appraisal, hence none is given. In his personal experience the writer has preferred to "lump" all these elements of value into the one general allowance of ten percent, described on page 66, this method probably performing as efficient service as would more elaborate treatments based on assumptions that rendered

the results no more reliable or accurate than does the simpler process thus used.

Commission Bases of Valuation: In practically every state of the Union there is now a regulatory commission having more or less jurisdiction over the rates and services furnished by public service corporations. It is to be expected these organizations should have the expert experience and knowledge required for the successful determination of the issues presented to them in rate matters and others involving complaints of service. The writer therefore undertook to acquire a general idea as to the relative practices of the various commissions, especially as they concerned the valuation of property coming under their scrutiny. For the purpose of affording comparative data there was prepared the following letter, a copy of which was forwarded to each state and territorial commission:

"In support of my application for the degree of civil engineer from the University of Illinois, I am preparing a thesis on VALUE FOR RATE MAKING PURPOSES, and desire to incorporate therein data concerning the attitudes of the several state commissions towards various bases of appraisals used for public utility properties. With this purpose in view, I should greatly appreciate answers from your Commission to the following questions:

1. When was the Commission first organized?
2. Please check off on the following list those utilities over which the Commission has rate making authority:

Street Railway	Interurban Railway
Electrical	Gas
Water	Heat
Telephone	Warehouse
3. Has the Commission officially adopted any particular basis of appraisal for public utility properties, and if so, what?
4. If none has been adopted officially, does the Commission advocate or give preference to a particular basis? If so, what?
5. Is accrued depreciation deducted when determining the rate base?
6. What value is acceptable for land?
(Present value of adjacent similar lands, or other)

Thanking you for your trouble in the matter, and assuring you of my appreciation of your courtesy, I remain,

Very truly yours,

(Signed) H. E. Bartlett

1447 East 66th Place, Chicago.

January 16, 1922.

Courteous replies to this letter were received from nearly all the commissions addressed, and many of them forwarded printed opinions and orders in which the answers to certain of the questions were amplified. It is, of course, impracticable to reproduce these letters in full within the limits of this article, and therefore the following summary has been prepared which briefly presents the various views and data as nearly as possible. It is, of course, clear that due latitude must be exercised in placing constructions upon the answers, as each commission necessarily is compelled to be governed by particular facts in a given case, so that no iron-clad rule for restricting its freedom could be adopted.

For example, many commissions accept as evidence appraisals made upon any common or accepted basis, and from these appraisals and supporting evidence finally determine the rate making value of the property. During the course of the hearing it is quite possible that appraisals made upon two or three bases may be submitted, and in such cases the commission must entertain them. Thus, the writer has in mind cases arising before the Illinois Public Utilities Commission in which, during the course of the hearings, appraisals of the same property were filed in evidence, these having been made upon the basis of original cost, or reproduction at existing prices, and upon ten-year average prices. These several elements were considered, and each was given due consideration, after which the Commission fixed the rate making value.

Alabama: No information.

Arizona: Arizona Corporation Commission organized April 28, 1912. It has jurisdiction over steam, street, and interurban railroads, electrical, gas, water, telephone, warehouse, and heating utilities, although there is none of the latter in the state at present. The Commission has not officially adopted any basis of appraisal. Reproduction value has been given preference as a rate base. Accrued depreciation has been deducted where same has been found to exist. Values of land are based upon the judgment of those familiar with real estate in the particular locality.

Arkansas: Arkansas Railroad Commission; By act of the general assembly of 1921 the Corporation Commission (created by act approved April 1, 1919) was abolished and was superseded by the first-named commission. The Arkansas Railroad Commission has no jurisdiction over public utilities within incorporated cities and towns, and therefore has very little to do with making rates for any public service corporation.

California: Railroad Commission of the State of California: Commission originally organized in 1897, with jurisdiction over railroad corporations only, but on March 23, 1912 assumed control over other utilities, including steam, street, and interurban railroads, electric, gas, water, telephone, steam heat, warehouse, water carriers, telegraph lines, oil pipe lines, cold storage warehouses, and automobile stage lines. The Commission has not officially adopted any basis of valuation, but in general for rate making inquiries it determines the depreciated reproduction value, and adds intangible values decreed by court. Accrued depreciation is deducted, as is also obsolescent or useless property. For land the Commission usually adopts the actual value as determined by recent transfers of adjacent similar real estate.

Colorado: Public Utilities Commission of the State of Colorado: Commission created in 1913, superseding the Colorado Railroad Commission, organized in 1885. Commission has jurisdiction over steam, street, and interurban railroads, and electric, water, telephone, and gas utilities. Has not officially adopted any basis of appraisal. Generally an original cost basis has been sought in establishing rate base, and frequently both reproduction cost new and original cost have been used in evidence. In several recent cases reproduction cost new appears to have been favored. In general, accrued depreciation has not been deducted from the fair value of the property in determining rate base, but some deviations have been made. For land there generally has been used the evidence of prominent local real estate men.

Connecticut: No information.

Delaware: Has no commission.

District of Columbia: Public Utilities Commission of the District of Columbia created by Act of Congress, approved March 4, 1913. Commission has jurisdiction over street railways, electric, gas, telephone, baggage transfer, taxicab, and motorbus utilities. As nearly as can be determined from the printed opinion of the Commission in its opinion in the matter of the valuations of the Capital Traction Company and the Washington Railway and Electric Company, the cost of reproduction less accrued depreciation is favored, with land values approximating those of similar adjacent real estate.

Florida: Florida Railroad Commission was first organized in 1887; was abolished in 1891; and recreated in 1897. The Commission has jurisdiction over steam and street railroads and telephone utilities. No official basis of valuation has been adopted, but Commission is inclined to give more weight to actual investment. In some cases accrued depreciation is deducted. For land usually original cost is most acceptable.

Georgia: Georgia Railroad Commission. No information.

Hawaii: Public Utilities Commission of Hawaii first organized in 1913. Has jurisdiction over street railway, electrical, water, gas, and warehouse utilities, and the question of jurisdiction over telephones is now before the Supreme Court. The Commission has not officially adopted any basis of valuation, but favors original cost, with no deduction for accrued depreciation. No formal valuation has thus far been made in Hawaii, and the question of land valuation has not been before the Commission.

Idaho: Public Utilities Commission of Idaho: The Commission was first organized May 8, 1913, and has jurisdiction over steam, street, and interurban railroads, and electrical, water, telephone, gas, heat, and warehouse utilities. For determination of rate base the commission follows the split-period method, which really is a variation of actual cost. In such cases accrued depreciation is not deducted. Land is valued upon the worth of similar adjacent real estate at the present time.

Illinois: Illinois Commerce Commission, created by act effective July 1, 1921, superseded Illinois Public Utilities Commission, organized January 1, 1914. Commission has jurisdiction over steam, street, and interurban railroads, electrical, water, telephone, gas, and heating utilities. Commission has not officially adopted any basis of valuation, but probably favors original cost. Accrued depreciation is deducted from reproduction valuations. Values of land are based upon worths of similar adjacent land at present time.

Indiana: Public Service Commission of Indiana was organized in 1913. The Commission has jurisdiction over steam, street, and interurban railroads, and electrical, water, gas, heating, and warehouse utilities. Thus far it has adopted no particular basis for appraisals, nor has it given preference to any. Accrued depreciation is deducted when determining the rate base. Land is valued at its present worth as nearly as same can be ascertained.

Iowa: Iowa Railroad Commission was first organized in 1878. Commission has jurisdiction over steam railroads and freight rates on interurban railways. It has neither adopted a particular basis for valuation nor given preference to such. Inasmuch as the commission has but limited jurisdiction, there is little need for appraisal data.

Kansas: The Kansas Public Utilities Commission has been succeeded by the Court of Industrial Relations.

Kentucky: The Kentucky Railroad Commission has no jurisdiction over utilities other than steam railroads. Inasmuch as the states now have little voice in the control over steam railroads, the Kentucky Commission therefore possesses but limited powers.

Louisiana: The Public Service Commission of Louisiana was first organized in 1898. It has control over steam, interurban, and street railroads, and electrical, water, telephone, gas, and heating utilities. No particular basis of valuation has been adopted officially, nor is preference given to any. The statement is made that the Commission has had no occasion to appraise any of the utility properties under its control.

Maine: The Public Utilities Commission of Maine was first organized in 1915. It has jurisdiction over steam, interurban, and street railroads, and electrical, water, telephone, gas, heat, and warehouse utilities. The Commission has not officially adopted any particular basis of appraisal. In the past it has given preference to reproduction cost based on five-year average prices. Generally accrued depreciation is deducted from reproduction cost. Present value of land, as measured by that of adjacent similar real estate, is used.

Maryland: The Public Service Commission of Maryland was organized in 1910. It has jurisdiction over steam, street, and interurban railroads, and electrical, water, telephone, gas, and heating utilities. The Commission has not adopted any particular method of appraisal, although it now is making one of the property of the Consolidated Gas Electric Light and Power Company, of Baltimore on a basis of reproduction. Definite information is not given concerning depreciation and land values.

Massachusetts: The Department of Public Utilities of Massachusetts was first organized in 1869, thus forming one of the earliest commissions. It has jurisdiction over steam, interurban, and street railroads, and electrical, water, telephone, and gas utilities. The Commission has adopted "the honest, original investment" as the basis of valuation. Accrued depreciation is not deducted.

Michigan: No information.

Minnesota: The Railroad and Warehouse Commission of Minnesota was organized, and has jurisdiction over steam, street, and interurban railroads, and telephone and warehouse utilities. From printed matter furnished by it the conclusion is drawn that it favors actual investment as a basis for rate making.

Mississippi: The Mississippi Railroad Commission exercises jurisdiction over steam railroads, telephone and telegraph companies, and to a limited extent over street railway, light, heat, and power companies serving municipalities. The law creating and governing the activities of the commission has been declared obsolete and a new law is now being prepared for submission to the legislature. The commission has adopted no basis for valuations.

Missouri: The Public Service Commission of Missouri was organized in April, 1913. It exercises authority over street and interurban railroads, and electric, water, telephone, gas, and heating utilities. The Commission has not adopted any basis of appraisals, but has given preference to those prepared on basis of actual cost. Accrued depreciation is deducted, which forms an exception to the practice of most commissions in not deducting depreciation when appraisals are made on investment cost. Present value of land, as measured by worth of similar adjacent lands, is used.

Montana: No information:

Nebraska: The Nebraska State Railway Commission was first organized in 1907. It has jurisdiction over steam and street railroads and telephone and telegraph companies. In making valuations the Commission's engineering department determines the original cost and the original cost less depreciation. As nearly as I can determine from the information furnished, the Commission values land in accordance with its present worth, as measured by similar adjacent real estate.

Nevada: The Public Service Commission of Nevada was first organized in 1907, and since 1911 has had jurisdiction over steam and street railroads, express companies, private car lines, electric, water, and gas utilities, and automobile common carrier lines. The Commission has not adopted any particular basis of appraisal, and "account is taken of accrued depreciation and the present value of adjacent similar lands".

New Hampshire: The Public Service Commission of New Hampshire was organized June 17, 1911. It has jurisdiction over steam, interurban, and street railroads, and electrical, water, telephone, and gas utilities. "The Commission gives a good deal of weight to the actual cost of construction of the properties when it is definitely known; also to reproduction cost and reproduction cost less depreciation when the actual cost is not known. The unit prices used in valuation are usually an average of 5 or 10 consecutive years, variously selected so as to give the approximate cost of the property in the instant case."

"The fair value as above determined is used as a rate base. If a sufficient amount has been earned to pay a fair return on the prudent investment and a fair amount for accrued depreciation, then the depreciated value is used as the depreciation reserve and the depreciated value is the whole property and the depreciation reserve should take care of itself. Present value of adjacent and similar land is considered, but the land may have a special value for the purpose for which it is to be used."

New Jersey: No information.

New York: First District: The Transit Commission of New York was created by act of 1921, superseding the former Public Service Commission, organized in 1907. To the present time the new Commission has made no decisions, but is now engaged in working out a plan of readjustment and rehabilitation of railroad properties in the greater city of New York.

Second District: Public Service Commission of New York was organized June 6, 1907 and has jurisdiction over steam railroads and to a limited extent over interurban and street railways. Also over electrical, gas, water, and telephone companies. The Commission requires appraisals to be submitted on basis of original cost where it can be determined or upon estimated original cost when the records showing actual cost are not obtainable. Accrued depreciation is deducted. For land values the "actual cost plus consideration of appreciated value on same."

North Carolina: The North Carolina Corporation Commission was organized in 1899. It has jurisdiction over street and inter-urban railways, and electrical, water, telephone, and gas utilities. Its methods of appraisals are prescribed by the state Revenues and Machinery Act, which practically amounts to actual cost less accrued depreciation.

North Dakota: The Board of Railroad Commissioners of North Dakota was first organized in 1885, at which time it had jurisdiction over what is now both North and South Dakota. The present board took over the control of public utilities in 1919, and now exercises jurisdiction over steam, street, and interurban railroads, and electrical, water, telephone, gas, and heat utilities, and limited authority over warehouses. The Commission has adopted a so-called historical cost for rate making purposes. Accrued depreciation is not deducted from the historical cost. Both the historical and the present costs of land are submitted to the Commission for such use as it desires to make.

Ohio: The Public Utilities Commission of Ohio was organized August 9, 1913, succeeding the Public Service Commission. The first public regulation of utilities in Ohio was enacted April 5, 1867, thus forming the oldest Commission of which I have record. The Commission has jurisdiction over steam and interurban railways, telephone, telegraph, electric, water, heating, artificial and natural gas companies, and package carrying companies. Since March 29, 1917, the Commission has used for determining the rate base the fair price obtaining over the five-year period preceding the date of the appraisal. Effective January 23, 1922, the basis of pricing will be changed to reproduction as of the date of the inquiry. Accrued depreciation is deducted. Land is valued upon the present worth of adjacent similar real estate.

Oklahoma: Corporation Commission of Oklahoma: No information

Oregon: No information.

Pennsylvania: The Public Service Commission of Pennsylvania was created in 1914, succeeding the Pennsylvania Railroad Commission which had been in existence for a number of years. The Commission has jurisdiction over steam, interurban, and street railroads, electric, gas, telephone, water, telegraph companies. It has not adopted any particular basis for appraisals. In the presentation of rate cases the Commission invariably has before it both the reproduction cost and the reproduction cost less accrued depreciation. Present value of land, as determined by the worth of adjacent similar lands, is used.

Rhode Island: The Public Utilities Commission of Rhode Island was organized in May, 1912, and has control over all the so-called public utilities, except water companies owned and operated by municipalities. As determined from the report of the Special Commission appointed by the Governor to investigate the affairs of the Rhode Island Company, it appears to me the Commission takes cognizance of the cost of reproduction new and the cost of reproduction less accrued depreciation. Land values appear to be based upon the present worth of adjacent similar real estate.

South Carolina: South Carolina Railroad Commission. No information.

South Dakota: The Board of Railroad Commissioners was originally created in 1885, as stated under "North Dakota". The present commission exercises jurisdiction over steam railroads and telephone and warehouse companies. The Commission has not officially adopted any basis of valuation, but favors cost of reproduction, deducting accrued depreciation. For land the present market worth is used.

Tennessee: The Tennessee Railroad Commission was created in 1897 with jurisdiction over steam railroads only. In 1919 there was created the Railroad and Public Utilities Commission, with authority over all public utilities not municipally owned, such as street and interurban railroads, electrical, water, telephone, gas, and heating companies. In fixing a value the Commission is controlled by the principles laid down by the courts, and ascertains the original cost and the cost of reproduction. Accrued depreciation is not deducted when determining rate base. Lands are valued on the basis of the worth of similar adjacent real estate.

Texas: The Railroad Commission of Texas was first organized in 1893. It has jurisdiction over steam railroads, oil pipe lines, and natural gas utilities, the latter authority being conferred in 1920. The Commission has adopted no definite basis of valuation. Mr. R. D. Parker, chief engineer of the Commission states: "The writer is inclined to the belief that the value which nearest approaches to justice to all concerned is that value which nearest approaches the legitimate actual investment, that is, the money which has gone into the creation of the property. The courts do not sustain such judgment if such value does not represent the 'value at the time of the inquiry'; but what the value at the time of the inquiry is is not defined." * * * "The cost to reproduce the property is a fluctuating base, rising and falling with the costs of labor and materials; yet it is advocated as the best measure of the value at the time of the inquiry. A rate should be reasonably stable and it cannot be so and follow a fluctuating base."

Utah: The Public Utilities Commission of Utah was organized April 1, 1917. It has jurisdiction over steam, interurban, and street railroads, and electrical, water, telephone, gas, heating, and warehouse utilities. The Commission has not officially adopted any particular basis of appraisals, nor does it favor such. Accrued depreciation is deducted in determining the rate base. Land is appraised on the basis of the fair present market value of adjacent similar lands.

Vermont: The Vermont Public Service Commission was first organized in 1908. It has jurisdiction over steam, interurban, and street railroads, and electrical, water, telephone, and gas utilities. The Commission has not adopted any particular basis of appraisal, nor does it favor such. Accrued depreciation is deducted in determining the rate base. The value of land as compared with similar adjacent real estate is considered as one of the elements of the worth of land.

Virginia: The State Corporation Commission of Virginia was organized March 1, 1908. It has control over steam, interurban, and street railroads, except where city charters provide for local control of the latter. Control is also exercised over water companies other than those municipally owned, and over telephone, gas, and heating utilities. For determining the rate base the Commission uses principally appraisals based on the cost of reproduction at pre-war prices, deducting accrued depreciation. Land is valued on the basis of the fair present worth of similar adjacent lands.

Washington: The Department of Public Works of Washington was created in 1921, succeeding the Public Service Commission, organized in 1911, which, in turn, superseded the Railroad Commission, created in 1905. The Commission has jurisdiction over steam, interurban, and street railroads, electrical, water, telephone, gas, and warehouse utilities, except those municipally owned. The Department has never officially adopted any particular basis of appraisal, but it is the practice of its engineering and auditing section to submit (a) the cost of the property as shown by the company records, (b) estimated cost of construction, determined by the split inventory method, (c) estimated cost of reproduction, using prices averaged over a reasonable construction period, or as of the date of the report, and (d) cost of reproduction less theoretical accrued depreciation. The Department does not deduct accrued depreciation in fixing the rate base. "Ordinarily the rate base fixed by this Department is very close to the estimated cost of construction, with a reasonable allowance for intangible elements, such as water rights, development costs, etc." Value of land is determined by value of adjacent similar lands, at least to a large extent.

West Virginia: No information.

Wisconsin: The Wisconsin Railroad Commission was organized in 1905 with control over railroad, express, Pullman, and telegraph companies. In 1907 the law was changed so as to give jurisdiction over the foregoing and also telephone, electric, water, street and interurban railways, gas, heating, and toll bridge utilities. The control over gas, electric, water, telephone, heating, and toll bridge utilities extends alike over municipally and privately owned. The Commission has not officially adopted any particular basis of appraisal. "In general, however, it uses a basis designed to reflect as nearly as possible the actual investment. During recent years it has used a ten-year average of prices prior to the war for property which was in existence at the beginning of the war and actual prices so far as determinable for property put in during the war." Accrued depreciation is not deducted in determining the rate base where properties have been properly maintained. Land is valued on its present day value subject to the rule in the Minnesota rate cases.

Wyoming: The Public Service Commission of Wyoming was organized April 1, 1915. It has jurisdiction over steam street, and interurban railroads, and electrical, water, telephone, gas, and heating utilities. The Commission has not adopted any particular basis of valuation, and does not favor such. Accrued depreciation is not deducted in determining the rate base. Land is valued at its actual worth, as determined by appraisement or otherwise.

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Based upon the information contained in the foregoing synopses, it is seen that public regulation of utilities began in Ohio in 1867, closely followed by the enactment of somewhat similar legislation in Massachusetts in 1869. Then followed a lull until 1878 when the Iowa Commission was organized. From that time on the growth of the idea has been comparatively constant, both in the number of commissions and the extent of their powers. The jurisdiction of the early commissions was confined practically to steam railroads and telegraph lines, but at the present time con-

trol is exercised over the activities of practically all utilities, as instanced by the Wisconsin, Illinois, California, and other commissions. However, a number of them even now have but little authority, inasmuch as their jurisdiction formerly extended mainly over the steam railroads. By reason of Federal legislation and decisions of the United States Supreme Court, the state commissions now have but slight authority over the steam railroads, and, inasmuch as the legislatures of many states have not seen fit to confer the necessary authority over other utilities, the commissions in those states are extremely limited in their functions. This is particularly true in the South, as represented by Mississippi, Texas, Kentucky, and Florida. In Kansas the Utilities Commission was abolished and superseded by the Court of Industrial Relations, and this organization has been the storm center of labor agitators and others during the past year. In many of the states the salaries paid the members of the commissions are so small as not to attract competent men, with consequent loss to the public and the utilities, and instances could be given of where employes of the commissions are paid more than are members of the organization.

Perusal of the synopses shows a wide diversity of opinion concerning the proper basis for rate making purposes, and in order to enable a somewhat quicker grasp of this phase of the matter than can be given by the summaries above, there has been prepared the following tabulation, briefly showing, as nearly as possible in the limited space available, the attitude of the various commissions on this important question:

		Commission				
State	Cre- ated.	Basis of Valuation for Rate Making				
Alabama		No information				
Arizona	1912	Cost of reproduction less depreciation favored.				
Arkansas	1921	Has little to do with utility rates				
California	1897	Depreciated reproduction value				
Colorado	1885	Generally seeks undepreciated original cost				
Connecticut		No information				
Delaware		No regulatory commission				
D. of Columbia	1913	Appears to favor depreciated reproduction cost				
Florida	1891	Prefers actual investment				
Georgia		No information				
Hawaii	1913	Favors undepreciated original cost				
Idaho	1913	"	"	"	"	"
Illinois	1914	Appears to favor undepreciated actual cost				
Indiana	1913	Has shown no preference; deducts depreciation				
Iowa	1878	No jurisdiction over utilities other than R.R.				
Kansas	1921	Court of Industrial Relations				
Kentucky		No jurisdiction over utilities				
Louisiana	1898	No preference; has not valued any properties				
Maine	1915	Prefers depreciated reprod'n on 5-year average				
Maryland	1910	Now making valuation on reproduction basis				
Massachusetts	1869	Has adopted undepreciated "honest investment"				
Michigan		No information				
Minnesota		Appears to favor actual investment				
Mississippi		Has but little jurisdiction over utilities				
Missouri	1913	Prefers depreciated actual cost				
Montana		No information				
Nebraska	1907	Commission engineers find depreciated actual in.				
Nevada	1907	No particular preference				
New Hampshire	1911	Gives weight to actual cost				
New Jersey		No information				
New York	1921	Has made no valuations				
" "	1907	Requires valuations of property on original cost				
North Carolina	1899	Practically equivalent to depreciated actual "				
North Dakota	1885	Has adopted "historical cost" undepreciated				
Ohio	1867	Depreciated 5-year average costs				
Oklahoma		No information				
Oregon		"	"	"	"	"
Pennsylvania	1914	Requires both actual and reproduction costs				
Rhode Island	1912	Appears to favor depreciated reproduction cost				
S. Carolina		No information				
S. Dakota	1885	Favors depreciated reproduction cost				
Tennessee	1919	Appears to favor original cost				
Texas	1893	Favors actual investment				
Utah	1917	Appears to favor depreciated reproduction cost				
Vermont	1908	"	"	"	"	"
Virginia	1908	Favors reproduction on pre-war prices				
Washington	1905	Rate base usually near undepreciated actual "				
W. Virginia		No information				
Wisconsin	1905	Favors undepreciated actual investment				
Wyoming	1915	No particular basis favored				

The tabulation on page 83 contains 50 names, and from this summary and the discussion beginning on page 73 general conclusions may be drawn as follows:

1. The earliest attempt at regulation was the enactment in Ohio in 1867 of a law to control railroads and telegraphs.
2. All states except Delaware have a regulatory commission with greater or less jurisdiction.
3. 10 states furnished no information in response to my request, viz., Alabama, Connecticut, Georgia, Michigan, Montana, New Jersey, Oklahoma, Oregon, South Carolina, and West Virginia.
4. 8 state commissions have practically no jurisdiction over the rates of utilities, viz., Arkansas, Florida, Iowa, Kentucky, Mississippi, Nebraska, South Dakota, and Texas.
5. Wisconsin appears to have conferred upon its commission the broadest powers possessed by any. However, this statement cannot be made with certainty owing to the fact that some commissions did not answer my request, and others may have broader powers than disclosed by the answers to the questionnaire. Personally I know of no other possessing powers over as many forms of utilities and also including those municipally owned. Wisconsin is popularly considered a high-grade commission.
6. Two states only have adopted a basis of valuation for rate making purposes. Massachusetts has adopted the "honest, original investment", and North Dakota has adopted the undepreciated historical reproduction cost.
7. Nine states appear to favor the cost of reproduction less accrued depreciation, viz., Arizona, California, District of Columbia, Maryland, Rhode Island, South Dakota, Utah, Vermont, and Virginia. This statement cannot be made with certainty because there are a number of modifications brought about by various considerations in particular cases, so that in some instances the same commission may appear to favor this basis, while in other cases some other basis may be considered best. However, the above is as near as I can come to segregating the preference.
8. Two states prefer depreciated reproduction cost based upon five-year average prices, viz., Maine and Ohio.
9. 15 states or commission appear to strongly favor the un-

depreciated original cost of the property, or its equivalent, as the proper basis of rate making. These states are Colorado, Florida, Hawaii, Idaho, Illinois, Massachusetts, Minnesota, Nebraska, New Hampshire, New York (up-state), North Dakota, Tennessee, Texas, Washington, and Wisconsin. This statement cannot be made with certainty for the reasons given under (7) on preceding page, but it appears to coincide with the facts as nearly as I can determine from the facts submitted to me.

10. Two states appear to favor depreciated original cost, viz., Missouri and North Carolina. The latter is accounted for by the fact that the valuations are largely for taxation purposes, as required under the Revenues and Machinery Act.

11. Five states appear to have no preferences in the matter, viz., Indiana, Louisiana, Nevada, Pennsylvania, and Wyoming. Perhaps a better statement of this would be that these commissions consider valuations on any basis.

12. In general, depreciation is deducted by the commissions when the valuations are based upon reproduction cost. When the rate base is determined by the actual investment, depreciation is commonly not deducted. Exceptions to this rule appear to be the states of Missouri and North Carolina, as shown in (10) above.

13. Without exception, the commissions accept the value of lands as that measured by the fair present worth of similar adjacent land. This may have been determined in various ways, such as opinion values of local persons familiar with such values, or by comparison of transfer values in the locality, or by other method. As nearly as can be determined from the information furnished me, it probably is not too broad a statement to say that this value is fixed upon in compliance with the decision of the United States Supreme Court in the Minnesota Rate cases.

14. In one state, Kansas, the regulatory commission has been succeeded by the Court of Industrial Relations, and I have before me no statement as to the authority of the latter in the way of rate making.

From the foregoing it appears that the state regulatory commissions overwhelmingly favor the undepreciated actual cost of a utility property as the proper amount for the rate base. This statement is, of course, modified to some extent by local conditions in particular cases, but appears warranted as a general summarization of the matter. Further discussion will be made in sub-

subsequent paragraphs dealing with the desirability of a single standard for rate making value.

True Rate Base: From such experience as he has had, the writer has reached very definite conclusions concerning the true basis of valuation for rate making purposes, which, in his opinion, is the undepreciated actual cost of the essential property used in supplying the service. In the following pages, therefore, attempt will be made to make clear the reasons for this opinion, both by showing certain advantages possessed by this basis and by setting forth various disadvantages of other methods.

In assuming the above position concerning the true basis of rate making, I am, of course, well aware that the method is not in favor with many utility operators and even with many courts and commissions. The position is taken on principle, however, regardless of the beliefs of others, and independent of the question as to how the return will be affected by this basis of valuation. I am far from one of those who believe that public regulation is for the purpose of starving an utility to death. Such procedure is not only morally wrong, but is even worse, for it is economic suicide. I cannot bring myself to believe that one group of citizens can be made to suffer financially, or otherwise, by another without injustice to the entire body politic. A case in point is the common union labor attitude towards the remainder of the public. By means of combination, coupled with intimidation or actual destruction of property, organized labor has so raised costs of all classes of articles as to bring suffering upon the general mass of the

citizenry. In so doing they also have injured themselves, as can be readily detected in the changed attitude of the public towards labor unions. As these have been conducted in the past in Chicago they are little better than holdup men, and the railroad brotherhoods have given two or three striking examples of the same tendencies during the past four years.

In considering particular merits or demerits of various methods for determining the rate base, it is well to point out that such base is determined from consideration of appraisals of the property made upon one or more well recognized bases, generally the actual cost or some form of reproduction method. And looking at the determination of the rate base in this light, it is obvious that, in every case, the one and only aim of the appraisal is to find the cost of the property. That is, no matter what the basis of the appraisal, its ultimate goal is some cost of the property, and in the following discussion this vital fact must be kept clearly in mind.

Now, in the determination of the reproduction cost of a property it is very clear that the cost which is determined is merely the estimated cost which is found through particular assumptions, such as the time at which the estimate is made, the prices that are used in the estimate, and the theory upon which the work shall be performed. All of these may have little or no relation to the actual cost of the work, the actual time at which the plant was constructed, or the actual way in which it was built. In no other affair of life is the theoretical substituted for the actual when

it is at all possible to determine the latter. No man building a house could be persuaded that the estimate of a contractor is as good or reliable as is the signed contract for the construction of the house at a specified price. In the one case he has nothing upon which to predicate his financial requirements in the matter, while in the latter case he feels secure in going ahead in the full knowledge that he will arrive at a definite place. It is a well-known fact that under a given set of conditions no two men will estimate exactly alike, and it is a frequent condition to find the estimates of several men upon the same structure to vary by from 40 percent to even 100 percent, while 10 percent is commonly considered rather close agreement. In the face of such conditions how can it be held that reproduction cost forms even an approach to a desirable basis of valuation?

Reproduction costs commonly are much higher than actual expenditures. In making up a bid for the construction of a proposed building, the contractor must protect himself by making his price high enough to care for any contingencies that may arise. In the same way, an engineer making an estimate of the cost of reproduction of a property must make it sufficiently high that all elements of expense shall be properly taken care of. In so doing the engineer may be actuated by the highest motives, and it is no reflection upon the profession that frequently different engineers may greatly differ in their estimates of the probable cost of a property. For, in the final analysis, it is a matter of skill and

judgment on the part of the appraiser, and these two qualities are as variant in engineers as in plumbers.

The sacrifice of the owners of a public utility property for the benefit of the public is directly measured by their actual expenditures therefor, and, so far as I am aware, it can be determined by no other standard. Reproduction "value" cannot measure it, for there is little or no relation between the two. The outlay which the company has made for the benefit of the public is a fixed amount at any given time, while the cost of reproduction varies with the time at which it is made and with the person who performs the work. I think it must be admitted that the owners of the property are entitled to a reward that is in proportion to the sacrifices they have made, hence there appears a direct connection between that reward and the actual investment in the plant.

Costs determined upon a reproduction basis other than historical are subject to continual changes, for logically they must vary with the time of the appraisal, for it would be no more than a coincidence to have the market prices of all the articles in a composite plant the same at two different times. All are familiar with the rapid price fluctuations that have taken place during the past five years, and these changes are of necessity reflected in the appraisal of any property made on a reproduction basis, whether prices be assumed as at the time of the appraisal, or averages during the preceding five or ten years. It is true that, when average costs are assumed, the fluctuation is much less, and in that

lies the admitted superiority of such basis over that of reproduction at market prices prevailing at the time of the inquiry. If, then, the greater freedom from fluctuations is afforded by average prices, it appears logical to assume that a basis which is still freer from such fluctuations must be more desirable. To me it seems clear that such is the case, and it requires no argument to prove that actual cost is less affected by market fluctuations than are other bases. This is so for the reason that only a comparatively small portion of a plant is installed in any particular year, and, while purchases made during any given time undoubtedly reflect market conditions, nevertheless these changes are not applied to such large portions of the property as they are when it is valued on a reproduction basis. Further, it is a common practice among utilities companies to minimize their purchases during periods of high market prices and to expand when costs decrease, and this fact also has a noticeable effect in lessening the variations between the actual and reproduction costs of a property at a specified time.

Under modern theories of rate making, among the earnings to which a public utility enterprise is entitled, is a reasonable return upon the "fair value" of the property. It is evident that if by fair value we mean reproduction cost, then the "value" of the property will vary from time to time, or even from day to day, as the market changes. Since rates should be no more than will afford a reasonable return, it then is equally plain that rates should

vary with the value of the property. As a matter of practical business, rates should be as stable as possible, for changes in them cause needless confusion and irritation to the consumers. Inasmuch as additions and betterments are made gradually, and usually are not made until clearly required by the needs of the business and therefore "carry themselves" from the beginning, it seems not to need argument to show that a stable rate base is highly desirable, and that this economic desideratum is best afforded by the actual investment.

In the usual application of theories to practical affairs in life, it seems clear that assumptions made in the use of the theory must be consistent throughout. If this test be applied to the determination of the reproduction cost, other than historical, of a property, it commonly will be found that consistency is not one of the jewels which will be found. Suppose, for example, we are valuing the property of a steam railroad company on a reproduction basis, assuming conditions as they exist at present. When the item of clearing and grubbing is considered, for instance, we must ascertain the cost of this work only through lands that now are timbered. But it usually happens that at the time the road was built it was constructed through many tracts of timber that since have been removed. Under our assumptions, no credit can be given for the expenditures actually made by the road for cutting that timber. But if credit is not given for this work, which was absolutely necessary, we cannot but have the feeling that the car-

rier has been deprived of a portion of the money that rightfully has gone into its property, and no argument, however specious, can convince us otherwise. The thought is there and will not down that the railroad is fairly entitled to a return on the expenditures it thus made for clearing and grubbing, and the appraiser at once is tempted to change the assumptions so as to permit the inclusion of these costs.

Come now to the same railroad where it now passes through a large city, with costly buildings at frequent intervals along its right of way. These structures were not there when the road was constructed, in fact, the land was perhaps raw prairie. What, then, is the cost of constructing the road through this territory? If we stick to our assumptions that it is the cost of reproducing the property under present conditions we are forced to determine what it would cost to cut a right of way through this costly land. This might be a fabulous sum, even if it can be conceived that the road could be constructed at all under the conditions now existing. Usually it could not, for, as a practical matter, the cost would be prohibitive, even if the road had the power of eminent domain under the circumstances, which it usually does not. To include any such enormous sums in the value of the property would be tantamount to forcing the public to pay rates which might be highly unreasonable, and is as repugnant to ordinary, right-thinking men, as would be the deprivation of the road of a return upon the money actually spent for clearing and grubbing, mentioned in the above

paragraph.

Speaking of this method of valuation, the United States Supreme Court stated:

"The cost of reproduction is of service in ascertaining the present value of the plant, when it is reasonably applied and when the cost of reproducing the property may be ascertained with a proper degree of certainty. But it does not justify the acceptance of results which depend upon mere conjecture." (Minnesota Rate cases, 230 U.S. 352,452).

Consider also the case of a street railway in which practically all its tracks are now in paving and have been for several years. Also, that when this railroad was constructed it was necessary to remove a considerable hill in order to secure a practicable grade. If we assume the road to be reproduced at the present time under existing conditions, the cost of removing this hill cannot be included in the appraisal, for it is contrary to our assumptions, inasmuch as the hill no longer exists. So much for the hill. If the tracks were reproduced under existing conditions, it would be necessary to remove a great deal of paving in order to lay them, and, if we stick to our assumptions, this cost could be included in the appraisal. But here we are confronted by the decision of the United States Supreme Court in the Des Moines gas case wherein the inclusion of the cost of removing paving above mains was specifically prohibited unless the paving actually was disturbed at the time the pipes were installed.

In a case such as that just mentioned the street railway company would lose in either event, unless the assumptions be changed so as to include the cost of removing the hill. So far as I can see, there can be no justice in thus depriving the carrier of a

return on the cost of grading down the hill, for the money was legitimately spent. On the other hand, the inclusion of costs of paving that was not disturbed when mains were laid is not only good law but it likewise is good sense. In such circumstances the company did nothing towards paying for the paving, and suffered no outlays necessitated by the installation of the paving. In passing it may be remarked that the question of the inclusion of the hill arises in a large proportion of street railway appraisals.

Instances of nature similar to the foregoing conflicts of assumptions with facts and the equities of particular cases are frequent, and many pages might be written giving examples. If no other reasons existed for condemning such reproduction valuations, the above should be sufficient. It is a general rule that when assumptions lead to ridiculous results the theory must be abandoned. The Ptolemaic theory of the movements of the heavenly bodies was excellent until its assumptions were riddled because they did not square with the facts. The fallacies involved in the assumptions destroyed the theory, for the general principles could not be changed at will to suit particular conditions that arose. This statement is likewise correct for all other theories, and I am unable to see why the ordinary reproduction theory of appraisal should form an isolated exception.

The cost of reproduction of a property based upon average prices prevailing throughout a term of years has the inherent defects of which the above examples are illustrative. In addition,

they have some characteristic faults not possessed by reproduction costs at present prevailing prices. For example, it may be required to find the cost of reproduction of an article no longer made, such as a pump, a particular type of engine, or other article. It is apparent that neither can the article be presently reproduced, nor can five-year average prices be consistently chosen to represent it. To all intents and purposes it cannot be reproduced, at least in a reasonable sense. How, then, can average costs of reproduction be compiled? I am free to confess that I do not know, unless it so happens that the five years include the year in which the articles were purchased, a condition that seldom happens. I have had the experience a number of times, recently in the case of a steam pump that is still in service, although it is of an obsolete type. I solved the problem by applying to the actual cost of the article a ratio representing the average increase of various similar pumps during the five years included in the price period. However, it is clear the method is a mere approximation to the theoretical assumptions necessary to the basis of appraisal.

Even worse is the case of an article that has but recently come upon the market. For instance, the writer has in mind the case of a duplex exciter (driven by either steam or electricity) that was patented as late as 1919 and put on the market some time in 1920. In determining the cost of reproduction of an electrical property there were used the averages of prices prevailing during a 10-year period prior to the time of the inquiry, and in-

cluding the year in which the exciter was put on the market, there arises the question of what constitutes the 10-year average price of the article. Clearly there is no such thing. But the article is a fact, and as such must be included in the appraisal, for the company uses it at least part of every day in the operation of the plant. As a practical matter, we must temporarily scrap our theory of reproduction and make use of some device which will answer the purpose of giving the exciter its proper place in the appraisal. Again, we resort to the books of the utility, find out the actual cost of the article, and apply to that cost a ratio representing the approximate averages of machines of the same class as the exciter, such as motor-generators, engine-driven exciters, or similar units. In this case, two things are very apparent, (1) that our theory of appraisal will not work in this case, and (2) that the average cost of such an article is substantially less than the actual amount paid for it, because it was purchased at the peak of prices. As I perceive it, an injustice was done the company, because it was deprived of a part of the cost of the article, and the general theory underlying the appraisal had to be amended in order to fit a particular case, just as a patch must be put on a pair of trousers to cover a particular hole. A patched theory, as I see it, is little better than a pair of patched trousers; neither is worth much.

The two examples just given show some of the weaknesses of the

theory when applied to particular situations, but further consideration thereof cannot here be given. There is, however, a further injustice that is occasionally wrought by average-price reproduction that deserves mention. We may consider the case of a plant largely constructed during the year 1920, when prices were at the peak. It is a matter of statistics that prices subsequent to that year were much less than obtained during that period, and the difference was much greater during the preceding three or four years, while during 1920 costs were almost double those prevailing in 1912 or thereabouts. Suppose this plant were valued on the basis of 10-year average prices. It is apparent that the actual investment of the company in the property would be nearly cut in two, to say nothing of the loss in depreciation, for, if the plant were appraised as of January 1, 1922, there would be a loss of value during at least one year of use. I cannot be persuaded that justice would be done the company to thus confiscate its investment, for that is the practical result. In other words, the theory has done injustice, and therefore should be abandoned for that particular property. Would it be any more just to the public if the matter were reversed? I think not.

In passing, it may be stated that no utility could keep its books on the basis of reproduction costs, and probably none ever tried it. It readily can be imagined the jumble into which the books would fall after even a short trial of such method, and by the end of one year the scheme would produce chaos in the affairs of the company. Expenditures for capital account would become

nothing but a meaningless mass of computed figures, varying with the capability of the man who made them and reflecting nothing on either land or sea. Additions and betterments would become a grotesque collection of amounts from which little of value could be gleaned, and an accountant would have as much difficulty in ascertaining the condition of the Plant and Investment account as he would encounter in finding the beginning of a circle.

If the cost of reproduction is the proper basis of valuation, then it must be regretted that the United States Supreme Court did not exactly define what constitutes a reasonable application of the theory.

TRUE RATE BASE

Having pointed out certain defects in the ordinary applications of the reproduction methods, perhaps it will be well to see if there is any other method that is reasonably free from serious clashes between assumptions and facts. Based upon his experience in making appraisals and in practical rate fixing, he has come to the conclusion, previously stated, that a fair basis of appraisals, practically free from the major defects hereinbefore discussed, is found in the undepreciated investment, wisely made, in the essential property used in supplying the services furnished by the utility. Reasons for this belief will be set forth in detail in the following discussion, and comparisons made with the various incon-

sistencies found in reproduction methods. Amounts determined in accordance with the procedure hereinafter outlined, I am convinced, will furnish the true rate base in any rate fixing proceeding.

In amplification of the definition of true rate base given in the preceding paragraph it may be stated that "essential property" includes the property actually used and useful in furnishing the services, and reasonable amounts for reserve capacity, such as lands, machinery, and other articles necessary to provide a continuous and reliable service in accordance with generally accepted standards of efficient construction and operation. There shall also be included proper allowances for overhead costs in installing the physical plant, together with sums representing any intangible values that may exist, the items named in this sentence commonly not being reflected upon the books of utility companies. Under this definition there is intended to be excluded those portions of plants built in excess of reasonable requirements and also all property not operated by reason of poor physical condition or not having use for it.

Principal among my reasons for advocating the actual investment in the property as the true rate base is that that amount is a fact, a statement that cannot be made of any reproduction "value". In my opinion, a truth derived from facts, is far superior to results established through the judgment or opinions of men, no matter how competent or honest they may be. The opinion of no human can possibly be preferable to an actuality established by a

sequence of events that are beyond controversy, and in just so far as we remove value from the realm of opinion, to just that distance do we go in the ascertainment of truth. The actual cost of the various items of property is the one outstanding fact that can be determined from the records of the company within a reasonable degree of accuracy. Reproduction costs are never found there, though they may be found in the catalogues in the bookcase.

In the determination of the actual investment we are not confronted with the necessity of shifting our basis of valuation in order to make it square with assumptions previously made. Thus, the cost of clearing and grubbing, discussed on page 91, would offer no particular difficulty in ascertaining, at least, its approximate cost, and this element of cost was an expenditure required of the company just as much as was the grading that still is in the roadbed. And upon that cost the company is entitled to a reasonable rate of return. Again, in the case of right of way through a city, discussed on page 92, it is utterly impossible to determine the reproduction cost of blazing a path through the built-up territory, yet we can determine with relative accuracy the present value of the lands as measured by the worth of similar surrounding tracts. Determination of the actual cost of placing the street railway track in paving, mentioned on page 93, offers no special difficulty, as it will likely be reflected upon the books. Similarly, the ascertainment of the actual cost of the obsolete pump or of the duplex exciter, recently patented, entails no great amount of trouble.

and wrecks no theory because of interferences between theory and fact. Neither would injustice be done a company who was forced to greatly increase its facilities during the peak prices of 1919 and 1920. In brief, the determination of actual cost encounters none of the pitfalls of the reproduction theory. If such is the case, why is not the one fact thus determined much superior to the collection of one or several opinions? It is.

But, it may be argued, actual cost is not usually shown on the books for the entire property. That such is the case cannot be denied, but that the failure of the books to exactly disclose the amount seriously vitiates the theory or practice of the method cannot, in my opinion, be maintained. The writer has had occasion to consult the books and records of many utilities companies, and it is his uniform experience that the costs of most major items of property are clearly reflected upon the books. For example, the rolling stock of a street railway company commonly comprises from one-fourth to one-third of the investment in the plant, yet I never have experienced any difficulty in ascertaining quite closely the costs of such equipment. Paving, which usually amounts to about one-fifth of the cost of the property, generally can be determined within a small degree of error. And so on with the remaining articles. As nearly as I now can form general conclusions in the matter, I am of the opinion that commonly about 80% of the cost of the property is directly reflected upon the books of the company. The remaining 20% is easily determinable within about 5% of the actual cost, and this brings the probable error of the entire determina-

tion within about one percent (1.0%) of the total value of the property. Contrast this with reproduction methods wherein there commonly is a difference at least 25 times as great. That is, it would be more nearly a coincidence than an agreement of judgment for two appraisals made by two different men to come within 25% of each other.

The actual cost of a public utility property directly reflects the sacrifice of the owners for the benefit of the public, and no other method of appraisal does this unless we consider historical reproduction accomplishes the end. However, throughout this discussion I purposely have considered historical reproduction nothing more than a method of ascertaining actual cost, hence do not look upon it as reproduction in the ordinary acceptance of that term. The actual cost of the property represents the money spent by the owners, and reproduction cost does not even pretend to do that. Of course the confusion in the minds of courts and commissions arises from lack of differentiation between market value and rate making value. In the minds of 99 out of each 100 persons there arises the question of how much a thing will sell for whenever its "value" is brought under scrutiny. But, as previously shown, market value has little or nothing to do with rate making value, the former being dependent upon a number of factors that have no bearing upon rates. As I see it, the lack of discernment of the difference between the two values is the underlying error in many of our court decisions. Certain it is that reading many of them inclines me to the belief just stated.

Many other superiorities of actual cost over reproduction "values" could be discussed with profit, but a few, briefly stated, must suffice. Books of all firms are uniformly kept upon the basis of actual cost. No discussion is required to show the bizarre results of undertaking to keep them upon any other basis, and this question is also touched upon at page 97, hence further comment is not required. Net additions and betterments naturally must be made to figures showing actual cost - any other basis would be ludicrous, and result in endless confusion to the bookkeeping system of the company. As above stated, it is the only basis not subject to gross inconsistencies as between facts and theories, hence gives more uniform and intelligent results. It affords a basis that appeals to the sense of justice of the ordinary citizen, for it is the only method which he understands, or upon which appeal can be made to him. The arguments in favor of this or that method of "higher valuation" are completely lost upon the ordinary citizen. He neither comprehends them nor cares to take the time to master even the rudiments attached to valuation methods other than the determination of actual cost. This is my judgment, for I have seen numerous attempts made to perform the feat, and I never have seen it succeed. He may accept the decisions of courts and commissions which discuss the pros and cons of the various theories, but invariably it will develop that he has only one anchor to his mind, and that is, the money invested in the enterprise. That he understands and nothing more. And it requires no argument to convince him that the company

should have a reasonable return on that amount. But you cannot bring him to admit that the reasonable return should be made upon some other amount, determined upon a set of assumptions for performing certain work in a specified way, that never can be performed nor will it ever be for the reasons that conditions will never be the same again as they were at the time the article was installed. Why build fancy castles on a sand foundation that is given to change with every blast of the wind? It is a waste of time and money.

Outside of the courts there probably is no force of government that has as wide jurisdiction in the determination of values of public utility properties as have the state commissions. Indeed, but a very small fraction of the cases reaching the commissions are carried to the courts for final settlement of questions of value. Hence, we properly may regard the attitude of the commissions as of paramount importance in the matter, and it is to be regretted that there exists such a want of uniformity of opinion among them upon this vital subject. I cannot but believe that if the commissions showed a better understanding of the principles underlying appraisals, this greater knowledge would be reflected, in due course of time, in a changed conception of the problem on the part of the courts. For, when all is done and said, the courts can decide issues only upon the evidence presented to them, and if they find no substantial agreement among those who should know what constitutes correct value for rate making, they cannot be

blamed if their decisions lack the niceties that come from a thorough understanding of the fundamentals involved. For, after all, the question is highly technical, and we cannot expect our courts to reflect the subtleties of these questions when the members of the bench and bar have but limited experience with them. They must depend upon those trained in that special field to furnish the evidence upon which can be built thoroughgoing and logical opinions or decisions, just as the engineer or other citizen must look to skilled lawyers to interpret the statutes or legal procedure. Therefore, in my opinion, the commissions should undertake some line of common endeavor looking to the training of some uniformity of thought concerning issues so vital as that of value of property undergoing rate making inquiry.

While the basis of valuation in use by each commission has already been briefly stated, nevertheless, in order that no misunderstanding may arise concerning the various attitudes assumed by them on questions of value, I deem it advisable to quote the reply to questions 3 and 4 in full, so that the reader may also be able to judge for himself. The answers received to these questions in my letter of January 16, 1922, are as follows:

Arizona: "Reproduction value has been given preference as a rate base."

California: "While the Commission has not adopted officially any particular basis, it generally, particularly in rate fixing proceedings, determines the depreciated reproduction value, together with the present value of the physical used and useful properties of the utility, adding thereto such intangible values as Court decisions have decreed have a value which must be included in a rate base."

Colorado: "Generally, an original cost basis has been sought in establishing a rate base. Frequently, both reproduction new cost and original cost have been used in evidence and given consideration; and, in several recent cases, reproduction new cost appears to have been favored.

Florida: "Inclined to give more weight to actual investment".

Hawaii: Q If none has been adopted officially, does the Commission advocate or give preference to a particular basis? A "Original Cost". Note: "No formal valuation or appraisal has ever been made in Hawaii."

Idaho: "In general, for the establishment of the physical base, we follow what is sometimes termed the split period method, but which really is an allowance of actual cost, as of the time of construction of service property, with present value as to real estate. Intangible elements vary so widely in the cases of different classes of utilities, as well as between individual utilities of a given class, that no rule can be announced which would be workable to which would not attach more exceptions that would be covered by the rule itself."

Indiana: "No preference has been given any particular basis, each appraisal being made in accordance with the particular facts involved in each case. Accrued depreciation is deducted from the depreciable property in determining the rate base."

Maine: "Commission has in the past given preference to reproduction cost based on 5-year averages."

Maryland: "The Commission is now engaged in a valuation of the property of Consolidated Gas, Electric Light and Power Company, of Baltimore, which valuation is being made on a reproduction basis, at the request of the company. The Commission cannot, of course, say at this time what weight will be given to this valuation in its determination of the final valuation for rate making purposes."

Massachusetts: "The basis adopted is the honest, original investment; therefore, it is necessary to go into the history of the property.

Missouri: "The Commission gives preference to the appraisal based on actual cost to the company at the time of construction, with the exception of land which is appraised on the basis of its present market value."

Nebraska: "In making a valuation of a public utility property the Commission's engineering department in its report shows the original cost value and the original cost less depreciation value. You, of course, understand that other factors entering into present fair values of properties are given consideration by the Commission."

Nevada: "This Commission has not adopted any particular basis of appraisal for public utility properties; each case, as it must, standing upon its own peculiar circumstances."

New Hampshire: "The commission gives a good deal of weight to the actual cost of construction of the properties in use in the public service when it is definitely known; also to reproduction cost and reproduction cost less depreciation, especially when the actual cost is not known. The unit prices used in valuation are usually an average of 5 or 10 consecutive years variously selected so as to give the approximate cost of the property in the instant case. Going value, results of operations, and all matters having any relation to value are duly considered and the fair value fixed!"

New York: (Albany) "The basis of submission of an inventory and appraisal to the Commission is required upon the basis of original cost where obtainable or upon estimated original cost where the records showing same are not obtainable."

North Dakota: "This Commission has adopted a so-called Historical Cost Basis for valuing public utilities for rate making purposes. Historical cost in the sense that it attempts to arrive at the year of installation of any particular part of a utility's property, and to price that equipment with labor and material prices current in that year."

Ohio: "Since March 29, 1917, this Commission has used 'the fair price obtaining over the five year period preceding the date of the appraisal in appraising properties of public utilities for rate making purposes.' Effective the 23rd day of this month (January, 1922) the basis of pricing will be changed to the date certain price. Accrued depreciation is always deducted in all rate calculations. The present value of land is used in all rate calculations."

Pennsylvania: "The Commission has not adopted any general rules relating to appraisal nor has it adopted any particular basis. Each case is decided on its individual circumstances."

South Dakota: "Cost of reproduction new." Accrued depreciation is deducted.

Tennessee: "In considering Rate Base, the Commission has endeavored to follow the recognized principles laid down by the Supreme Court of the United States in its decisions and the courts and commissions of other states, keeping in view the fact decided by Supreme Court that a Commission, in fixing the value of rate base is not controlled by any fixed rules or formulas, but is governed by the facts in each case. The Commission exercises a reasonable judgment after full and due consideration of all relevant facts. In fixing valuation, the Commission ascertains the original or historical cost, estimates of reproduction new, estimate of reproduction cost new less depreciation, and other elements."

Texas: We have adopted no defined basis of value for rate purposes * * *. We are not quite sure that a fixed rule can be set up for fixing such values. Such action would limit freedom of judgment of individual cases to a measurement by a yard stick. It seems to us better to handle this matter * * * With respect to natural gas utilities, jurisdiction has but recently been conferred upon this Commission and but two or three cases have come up to us for decision, our jurisdiction being upon appeal only. In these cases, we have ascertained the cost of the property, the cost to reproduce at the time of the inquiry, and the cost to reproduce less depreciation, From these figures we reach a judgment as to the value to be used as a rate base, which value may not be any of the above bases * * *. The writer is inclined to the belief that the value which nearest approaches to justice to all concerned is that value which nearest approaches the legitimate actual investment, that is, the money which has gone into the creation of the property. The courts do not sustain such judgment if such value does not represent the 'value' at the time of the inquiry; but what the value at the time of the inquiry is is not defined and must, in the light of decisions, represent the judgment of the tribunal before which a case is heard of the value when all conditions are taken into account. The cost to reproduce the property is a fluctuating base, rising and falling with the costs of labor and materials; yet it is advocated as the best measure of the value at the time of the inquiry. A rate should be reasonably stable, and it cannot be so and follow a fluctuating base. The cost to reproduce, less depreciation, is subject to the same criticism, and, moreover, has the weakness of being an estimate upon opinion, or, to put it bluntly, a guess, as no absolute measure of depreciation can be established; and it further introduces the question of consideration of accrued depreciation. If accrued depreciation has been earned from the rate and there has been set aside a depreciation fund for the amortization of the property, such depreciation may in justice be deducted from the value at the time of the inquiry. If it has been earned and distributed to the stockholders in dividends or used in plant expansion or extension, the case is not altered." (Signed) R.D.Parker, Chief Engineer Gas Utilities.

Virginia: "Mainly pre-war reproduction plus additions at war and post-war prices."

Washington: "It is the practice of the Engineering and Auditing Section to submit the following items in a valuation proceeding:

- a. Cost of property as shown by the utility's records.
- b. Estimated cost of construction. This is arrived at by the split inventory method, using unit prices applicable to the several periods into which the inventory is divided.
- c. Estimated cost of reproduction. This is arrived at by using unit prices as of the date of the report or average unit prices over a reasonable construction period terminating on the date of the report.
- d. Cost of reproduction less theoretical accrued depreciation.

This department has never deducted accrued depreciation in determining the rate base."

Wisconsin: "The Commission has not officially adopted any particular basis of appraisal in so far as any definite commitment to such basis is concerned. In general, however, it uses a basis designed to reflect as nearly as possible the actual investment. During recent years it has used a ten year average of prices prior to the war for property which was in existence at the beginning of the war and actual prices so far as determinable for property put in during the war period. * * * Accrued depreciation is not deducted in determining the rate bases where properties have been properly maintained * * *".

Wyoming: The Commission has not adopted any particular basis, nor does it give preference to any.

From the foregoing it appears that the statement made by me in the last paragraph on page 85 " * * * it appears that the state regulatory commissions overwhelmingly favor the undepreciated actual cost of a utility property as the proper amount for the rate base" is not too strong. In this connection, attention is particularly drawn to the excerpt from the letter of the chief engineer of gas utilities of the Texas commission. In that letter Mr. Parker has quite lucidly set forth some striking facts connected with

the determination of rate base and coordinated questions.

In Re Rates of the Public Service Gas Company, the New Jersey Commission stated:

"We are inclined to estimate the value of the physical property by using all available information with regard to values; and especially are we inclined to accept as a measure of value for all the physical property of the company the unit costs to the company for that part of the property constructed during the past eight years." 1 N.J.B.P.U.C.433.

Touching upon this matter, in the Western Advance Rate Case, 20 I.C.C.Rep. 307, the Interstate Commerce Commission stated:

"Perhaps the nearest approximation to the fair standard is that of bona fide investment - the sacrifice made by the owners of the property - considering as a part of the investment any shortage of return that there may be in the early years of the enterprise. Upon this, taking the life history of the road through a number of years, its promoters are entitled to a reasonable return. This, however, manifestly is limited; for a return should not be given upon wastefulness, mismanagement or poor judgment, and always there is present the restriction that no more than a reasonable rate should be charged."

Where properties have been normally maintained and excessive earnings have not been had, no deduction from rate base should be made because of accrued depreciation in the plant. This is just and right for the simple reason that the investment in the property does not depreciate even though there be loss in the physical items because of use, exposure to the elements, obsolescence, and other factors of deterioration. It is manifest the physical plant cannot be kept in 100 percent condition, for decay begins the moment the articles are put into use, and continues until they no longer are of service. However, in the interim they may be rendering 100 percent service, and thus be fully as good for use as a

new set of articles of the same kind. As a matter of fact, the normal operating condition of a plant may be 100 percent and its physical condition 75 percent, while it seldom is above 78 percent in the best maintained plants. But the investment in the articles still in service has not decreased, hence the rate base should not be lessened by reason of accrued depreciation unless there has been mismanagement, excessive earnings without proper provisions in the way of a depreciation reserve, or similar cause. So clear is the justice of these statements that further argument thereon is considered unnecessary.

In closing, the writer desires to make plain that, in the advocacy of the actual investment in the property as a proper rate making base, he does so from no motive of unduly reducing the value of a public utility property. On the contrary, he is a firm believer in the liberal treatment of such properties, not only as a matter of justice but also as a measure of benefit to the consumers of the services. It has been my uniform experience that by far the larger proportion of persons prefer good service at a fair price than poor service at a low price, for in the former case there is not only a real saving in money but there is an added satisfaction that is not present when the consumer is burdened with poor service. A poverty-stricken public service corporation is a pitiable object, unable to properly fulfill its duty to either its stockholders or the public, and far better is it that they be permitted a liberal earning than that they be subjected

to judicial starvation by reason of the action of a narrow-minded regulatory commission which mistakenly thinks it thereby is "saving the people". For in the end such tactics not only grievously injure the utility, but they force upon the consumers an unsatisfactory service, or may even deprive them of it altogether. And modern life without these services is almost unthinkable, as may be easily brought to mind by even such a slight mishap as the blowing of the fuse in the circuit which furnishes your home with electric light.

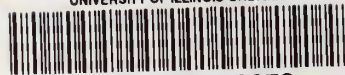
In my opinion, the proper way to dispose of the questions involved in the determination of rates and values is the fixing the rate base at the undepreciated, honest investment, in the essential property used in furnishing the service, and then permitting the company to earn such return thereon as shall insure its financial stability and attract the capital that from time to time may be required to care for extensions and the upkeep of the plant. A prosperous utility is a direct asset to the community which it serves, and every encouragement should be given it in the endeavor to supply its patrons with reliable service at a reasonable price.

Chicago, Illinois

March 15, 1922.



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